State: *Missouri* ***Filing Company:*** *NCCI Inc*
TOI/Sub-TOI: *16.0 Workers Compensation/16.0004 Standard WC*
Product Name: *Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022*
Project Name/Number: */*

Filing at a Glance

Company:	NCCI Inc
Product Name:	Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022
State:	Missouri
TOI:	16.0 Workers Compensation
Sub-TOI:	16.0004 Standard WC
Filing Type:	Rate
Date Submitted:	08/23/2021
SERFF Tr Num:	NCCI-132953901
SERFF Status:	Closed-REVIEWED
State Tr Num:	411
State Status:	REVIEWED
Co Tr Num:	MISSOURI LC 01012022
Effective Date Requested (New):	01/01/2022
Effective Date Requested (Renewal):	01/01/2022
Author(s):	Lesley O'Brien, Miguel Joubert, Nancy Mattei, Tyler Santos, Kevin Green
Reviewer(s):	Patrick Lennon (primary)
Disposition Date:	11/01/2021
Disposition Status:	REVIEWED
Effective Date (New):	01/01/2022
Effective Date (Renewal):	01/01/2022

State Filing Description:

State: Missouri **Filing Company:** NCCI Inc
TOI/Sub-TOI: 16.0 Workers Compensation/16.0004 Standard WC
Product Name: Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022
Project Name/Number: /

General Information

Project Name:
Project Number:
Reference Organization:
Reference Title:
Filing Status Changed: 11/01/2021
State Status Changed: 11/01/2021
Created By: Nancy Mattei
Corresponding Filing Tracking Number:
State TOI: 16.0 Workers Compensation

Status of Filing in Domicile:
Domicile Status Comments:
Reference Number:
Advisory Org. Circular:
Deemer Date:
Submitted By: Nancy Mattei
State Sub-TOI: 16.0004 Standard WC

Filing Description:

In accordance with the applicable statutes and regulations of the state of Missouri, we are filing advisory voluntary loss costs and rating values to be effective January 1, 2022 for new and renewal policies.

Company and Contact

Filing Contact Information

Carla Townsend, State Relations Executive
901 Peninsula Corporate Circle
Boca Raton, FL 33487-1362
carla_townsend@ncci.com
561-893-3819 [Phone]
561-893-5779 [FAX]

Filing Company Information

NCCI Inc
901 Peninsula Corporate Circle
Boca Raton, FL 33487
(561) 893-3186 ext. [Phone]
CoCode:
Group Code:
Group Name:
FEIN Number: 65-0439698
State of Domicile: Florida
Company Type:
State ID Number: 9999-8500

State: *Missouri* ***Filing Company:*** *NCCI Inc*
TOI/Sub-TOI: *16.0 Workers Compensation/16.0004 Standard WC*
Product Name: *Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022*
Project Name/Number: */*

Filing Fees

State Fees

Fee Required?	Yes
Fee Amount:	$150.00
Retaliatory?	No
Fee Explanation:	
Per Company:	Yes

Company	Amount	Date Processed	Transaction #
NCCI Inc	$150.00	08/23/2021 07:11 AM	208407208
EFT Total	**$150.00**		

State Specific

NAIC Number: NA
Have you reviewed the General Instructions document? (yes/no)(General Instructions updated 06/16/2017): Yes
If this is a rate filing, was rate data added on the rate/rule schedule? (yes/no): Yes
Are you paying the $150 per company per submission filing fee electronically using EFT? The utilization of SERFF and EFT for filings of papers, documents, and reports is now required, per 20 CSR 100-1.900.: Yes

SERFF Tracking #:	*NCCI-132953901*	***State Tracking #:***	*411*	***Company Tracking #:***	*MISSOURI LC 01012022*

State:	*Missouri*	***Filing Company:***	*NCCI Inc*
TOI/Sub-TOI:	*16.0 Workers Compensation/16.0004 Standard WC*		
Product Name:	*Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022*		
Project Name/Number:	*/*		

Correspondence Summary

Dispositions

Status	Created By	Created On	Date Submitted
REVIEWED	Patrick Lennon	11/01/2021	11/01/2021

Objection Letters and Response Letters

Objection Letters

Status	Created By	Created On	Date Submitted
PENDING INDUSTRY RESPONSE	Patrick Lennon	09/24/2021	09/24/2021
PENDING INDUSTRY RESPONSE	Patrick Lennon	09/01/2021	09/01/2021

Response Letters

Responded By	Created On	Date Submitted
Nancy Mattei	10/01/2021	10/01/2021
Nancy Mattei	09/15/2021	09/15/2021

Filing Notes

Subject	Note Type	Created By	Created On	Date Submitted
Objection Response Extension	Note To Reviewer	Nancy Mattei	09/02/2021	09/02/2021

SERFF Tracking #:	*NCCI-132953901*	***State Tracking #:***	*411*	***Company Tracking #:***	*MISSOURI LC 01012022*

State:	*Missouri*	***Filing Company:***	*NCCI Inc*
TOI/Sub-TOI:	*16.0 Workers Compensation/16.0004 Standard WC*		
Product Name:	*Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022*		
Project Name/Number:	*/*		

Disposition

Disposition Date: 11/01/2021
Effective Date (New): 01/01/2022
Effective Date (Renewal): 01/01/2022
Status: REVIEWED

Comment: Thank you for your filing submission. At this point in time, I do not have any further questions and am concluding my review of this filing. Please note that the closure of this filing does not constitute an approval by the Department and does not mean the Department is precluded from initiating future inquiries or from taking further administrative or legal action. Ultimately, the insurance company is responsible for ensuring it is in compliance with Missouri insurance law through its administration of insurance policies and handling of claims.

Company Name:	Overall % Indicated Change:	Overall % Rate Impact:	Written Premium Change for this Program:	Number of Policy Holders Affected for this Program:	Written Premium for this Program:	Maximum % Change (where req'd):	Minimum % Change (where req'd):
NCCI Inc	-7.700%	0.000%	$0	0	$0	19.800%	-28.000%

Schedule	Schedule Item	Schedule Item Status	Public Access
Supporting Document	Actuarial Justification	REVIEWED	Yes
Supporting Document	Electronic Rate Submission	REVIEWED	Yes
Supporting Document	Exhibits A & B (20 CSR 500-6.950)(2)	REVIEWED	Yes
Supporting Document	Filing Memorandum	REVIEWED	Yes
Supporting Document	Filing Narrative	REVIEWED	Yes
Supporting Document	Interrogatory Response	REVIEWED	Yes
Supporting Document	Interrogatory Response 9/24/2021	REVIEWED	Yes
Rate (revised)	New Filing	REVIEWED	Yes
Rate	New Filing	SUPERSEDED	Yes

State: Missouri **Filing Company:** NCCI Inc
TOI/Sub-TOI: 16.0 Workers Compensation/16.0004 Standard WC
Product Name: Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022
Project Name/Number: /

Objection Letter

Objection Letter Status	PENDING INDUSTRY RESPONSE
Objection Letter Date	09/24/2021
Submitted Date	09/24/2021
Respond By Date	10/01/2021

Dear Carla Townsend,

Introduction:

Thank you for your response to our previous inquiry. Upon review of the information provided, the following concerns remain:

Objection 1

Comments: Regarding the response to objection 5 of the questions dated September 1, 2021, please explain the process where the mix impact was estimated by comparing a hypothetical AWW using CY 2019 AWW by sector with the 2020 employment mix by sector to the actual CY 2019 AWW. How was the hypothetical AWW chosen and were other hypothetical AWWs tested? Please provide a numeric example of this process.

Objection 2

Comments: Regarding the responses to objection 10 of the questions dated September 1, 2021:
a. Has this process changed from last years filing?

b. Please provide the underlying data and calculations for the following columns in Exhibit 10a:
i. Adjustment to Reverse AOE Credits
ii. Adjustment for Losses Associated with TPA Agreements
iii. Adjustment to Convert Losses from Net to Gross of Deductible
iv. Pct. Of Reported COVID-19-Related Losses to Total Losses

c. Were the same factors mentioned in 2.b. used in last years analysis?

Objection 3

Comments: Regarding Exhibit 22 that was submitted in response to objection 22 of the questions dated September 1, 2021, please provide the underlying data and calculations for the excess ratios derived in this exhibit.

Conclusion:

Please respond to this letter by the above date. This submission will be held in suspense pending your response. Feel free to contact me at Patrick.Lennon@insurance.mo.gov or 573-751-1946 should you have any questions or concerns.

Sincerely,

Patrick Lennon

State: Missouri **Filing Company:** NCCI Inc
TOI/Sub-TOI: 16.0 Workers Compensation/16.0004 Standard WC
Product Name: Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022
Project Name/Number: /

Objection Letter

Objection Letter Status	PENDING INDUSTRY RESPONSE
Objection Letter Date	09/01/2021
Submitted Date	09/01/2021
Respond By Date	09/15/2021

Dear Carla Townsend,

Introduction:

Thank you for your submission of this filing. Upon review, areas of concern for Missouri insurance regulatory guidelines were found. Please address the following objections and respond by the date above.

Objection 1

- New Filing, null (Rate)
Comments: DATA:

Have any of the data sources used in determining the Missouri Advisory Loss Costs and Rating Values Filing changed since the previous filing? For example, using data from a different data call to develop expenses.

Objection 2

- New Filing, null (Rate)
Comments: METHODOLOGY:

Please provide the estimated overall impact for each change in methodology from the previous filing.

Objection 3

- New Filing, null (Rate)
Comments: CATASTROPHE PROVISION:

Please provide support for the selected catastrophe provision (other than Certified Acts of Terrorism) of $0.01 per $100 of payroll in Missouri.

Objection 4

- New Filing, null (Rate)
Comments: COVID-19-RELATED CLAIMS:

How many COVID-19-related claims were removed from reported loss data in Missouri and Countrywide, and what was the total cost of these claims in Missouri and Countrywide?

Objection 5

- New Filing, null (Rate)
Comments: WAGE ADJUSTMENT:

How was the 2020 average weekly wage adjusted to exclude the estimated impact of pandemic-related industry-sector mix change?

How was it determined what industry-sector mix changes were expected to return to pre-pandemic levels over time and what changes were expected to persist?

Objection 6

- New Filing, null (Rate)
Comments: COVID-19-RELATED ADJUSTMENTS

Was it assumed in this analysis that 2022 will mark a return to pre-COVID-19 loss and wage levels, or was there consideration given to the impact of the Delta variant or other variants on claims and economic conditions in 2022?

Objection 7

- New Filing, null (Rate)
Comments: LOSS DEVELOPMENT FACTORS:

Please provide loss development triangles with at least 10 diagonals for both the voluntary and assigned risk markets separated by indemnity, medical, and DCCE for the past 19 years. In the prior year, this was submitted as Exhibit 4 Development Triangles.xlsx. An updated version of this file will suffice for these purposes.

Objection 8

- New Filing, null (Rate)
Comments: LOSS DEVELOPMENT FACTORS:

Please provide an Excel file with the specific calculations used to determine Appendix A-II, Section G, column (6) for the most recent year.

Objection 9

- New Filing, null (Rate)
Comments: LOSS DEVELOPMENT FACTORS:

Please provide an excel file spreadsheet with the specific calculations that provide the derivation of the 0.778 factor in Appendix A-II, Section H, line 2.

Objection 10

- New Filing, null (Rate)
Comments: AOE AND DCCE RATIOS: Exhibit II Sections A and B Page 46 of 97:

a) Please provide the underlying data and calculations to bring AOE and DCCE to an ultimate level including the development factors, AOE, DCCE, losses, and any other values used to determine the Ultimate AOE and DCCE ratios.
b) Please provide the Ultimate AOE Ratios for MO only data.
c) In the prior years filing, the AOE provision from MO was selected based on a countrywide and MO specific analysis. Was this process still used in this filing?

Objection 11

- New Filing, null (Rate)
Comments: POLICY YEAR ON-LEVEL FACTORS: Appendix A-I Section A and Section D Pages 48 and 49 of 97:

Please provide the underlying data and calculations to support the factors in column (6).

Objection 12

- New Filing, null (Rate)
Comments: POLICY YEAR ON-LEVEL FACTORS: Appendix A-I Section A and Section D Pages 48 and 49 of 97:

State: Missouri **Filing Company:** NCCI Inc
TOI/Sub-TOI: 16.0 Workers Compensation/16.0004 Standard WC
Product Name: Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022
Project Name/Number: /

Please provide the underlying data and calculations to support the factors in column (7). More specifically, how is the targeted off-balance factor of 0.952 determined?

Objection 13

- New Filing, null (Rate)
Comments: INDUSTRY GROUP DIFFERENTIALS:

Appendix A-IV Section I Page 63 of 97: Please show the calculations underlying the factors in Col (4) and Col (5).

Objection 14

- New Filing, null (Rate)
Comments: LIMITED LOSS DEVELOPMENT FACTORS: Appendix B-I Section I Page 66 of 97:

Please provide underlying data and calculations for how the Likely-to-Develop and Not-Likely-to-Develop columns are calculated.

Objection 15

- New Filing, null (Rate)
Comments: TREND: Page 62 of 97 (Appendix A-III).

Provide the underlying data, fits, assumptions, calculations, selections and rationale of the selection of the indemnity and medical trend factors. Please include an update of the excel file provided last year entitled Exhibit 14 Supplemental Loss Development and Trend.

Please include fifteen years of information including:
Lost-Time claim frequency and severity based on data in excess of wage inflation
Claim counts
Premium
Limited indemnity losses
Limited medical losses

Objection 16

- New Filing, null (Rate)
Comments: F-CLASS COUNTRYWIDE PURE PREMIUM TREND: Appendix B-IV Part 1 Section A.2, Page 77 of 97:

Why are the current annual trends of 0.980 and 0.990 for indemnity and medical, respectively, used to trend losses rather than the selected trends of 0.975 and 0.985?

Objection 17

- New Filing, null (Rate)
Comments: F-CLASS COUNTRYWIDE PURE PREMIUM AND RELATIVITIES: Appendix B-IV Part I Section C Page 79 of 97:

Please provide the underlying data, assumptions, and calculations used to determine Missouris index to Countrywide factor of .684.

Please provide the data and calculations described on steps 1 to 5 for Missouri.

Objection 18

- New Filing, null (Rate)
Comments: F-CLASS COUNTRYWIDE PURE PREMIUM AND RELATIVITIES: Appendix B-IV Part I Section D Page 79 of 97:

State: Missouri **Filing Company:** NCCI Inc
TOI/Sub-TOI: 16.0 Workers Compensation/16.0004 Standard WC
Product Name: Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022
Project Name/Number: /

Please provide the underlying data, assumptions, and calculations used to determine the 10-Year Expected Unlimited Countrywide Losses in Col (2).

Objection 19

- New Filing, null (Rate)
Comments: F-CLASS COUNTRYWIDE PURE PREMIUM AND RELATIVITIES: Appendix B-IV Part I Section D Page 79 of 97:

Regarding Col (4), what is considered a limited amount of data that would equate to a class code having their relativity set to 1.000 per the footnote?

Objection 20

- New Filing, null (Rate)
Comments: F-CLASS COUNTRYWIDE PURE PREMIUM AND RELATIVITIES: Appendix B-IV Part II Section A.1 Page 80 of 97:

Please provide the underlying data and calculations for the State Act Pure Premium Relativity Factor of 1.462.

Objection 21

- New Filing, null (Rate)
Comments: F-CLASS COUNTRYWIDE PURE PREMIUM AND RELATIVITIES: Appendix B-IV Part II Section B.4. Page 80 of 97:

Please provide the underlying data and calculations for the Federal Act Loss-Based Assessment of 1.115.

Objection 22

- New Filing, null (Rate)
Comments: F-CLASS EXCESS RATIOS: Appendix B-IV Section B Page 78 of 97:

Please provide the underlying data and calculations to support the Excess Ratios in Row (1).

Objection 23

- New Filing, null (Rate)
Comments: F-CLASS COUNTRYWIDE PURE PREMIUM AND F-CLASS COD RELATIVITIES:

Why were relativities for class codes with limited data set to 1.000 rather than credibility weighting or similar?

Objection 24

- New Filing, null (Rate)
Comments: F-CLASS LIMITED LOSS DEVELOPMENT FACTORS: Appendix B-IV Section 3 Page 78 of 97:

Please explain why the losses developed to an ultimate basis using loss development factors based on country wide data excludes data from Texas.

Objection 25

- New Filing, null (Rate)
Comments: F-CLASS POLICY PERIOD:

Why do the Policy Periods found in Appendix B-IV only go up to Policy Year 2017 and not Policy Year 2019 like the other Policy

State: Missouri **Filing Company:** NCCI Inc
TOI/Sub-TOI: 16.0 Workers Compensation/16.0004 Standard WC
Product Name: Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022
Project Name/Number: /

Periods in the filing?

Objection 26

- New Filing, null (Rate)
Comments: VOLUNTARY MARKET INDICATION:

Please provide the indication as of 1/1/2022 if all assigned risk experience was excluded.

Please provide these calculations in an excel file and include all the underlying components that will change because they are based on only voluntary experience, such as loss development, trend, LAE, etc.

Objection 27

- New Filing, null (Rate)
Comments: SMALL CLASSES:

Please provide any updates on class ratemaking research, status and results, or stability performance results on tests of the performance of the recently implemented small class ratemaking project intended to address the stability of the small classes.

Objection 28

- New Filing, null (Rate)
Comments: CLASSIFICATION:

Please provide an Excel file with seven columns of information. The first column should be the class code, the second column should be the exposures by class code, the third column should be the current advisory loss cost, the fourth column should be the proposed advisory loss cost by class code and the last three columns should
be the percentage loss cost changes effective 2022, 2021, and 2020 by class code. Include totals in columns 4, 5 and 6 and please exclude discontinued classes. This file was submitted as Exhibit 18 Loss Cost Comparison.xlsx in last years filing.

Objection 29

- New Filing, null (Rate)
Comments: VOLUNTARY MARKET AND ASSIGNED RISK PLANS:

Please confirm that the indication provided in Exhibit I is an indication for the voluntary market but that the data upon which it is based is on combined voluntary and assigned risk plan losses. If not, please explain.

Please confirm that although the voluntary indications are based on combined voluntary and assigned risk plan data, that you are not providing loss costs or rates for the assigned risk market

Conclusion:

Please respond to this letter by the above date. This submission will be held in suspense pending your response. Feel free to contact me at Patrick.Lennon@insurance.mo.gov or 573-751-1946 should you have any questions or concerns.

Sincerely,
Patrick Lennon

SERFF Tracking #:	*NCCI-132953901*	***State Tracking #:***	*411*	***Company Tracking #:***	*MISSOURI LC 01012022*

State:	*Missouri*	***Filing Company:***	*NCCI Inc*
TOI/Sub-TOI:	*16.0 Workers Compensation/16.0004 Standard WC*		
Product Name:	*Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022*		
Project Name/Number:	*/*		

Response Letter

Response Letter Status	Submitted to State
Response Letter Date	10/01/2021
Submitted Date	10/01/2021

Dear Patrick Lennon,

Introduction:

Good afternoon,

Response 1

Comments:

Responses are in the Rate/Rule and Supporting Documentation tabs.

Related Objection 1

Comments: Regarding the response to objection 5 of the questions dated September 1, 2021, please explain the process where the mix impact was estimated by comparing a hypothetical AWW using CY 2019 AWW by sector with the 2020 employment mix by sector to the actual CY 2019 AWW. How was the hypothetical AWW chosen and were other hypothetical AWWs tested? Please provide a numeric example of this process.

Changed Items:

Supporting Document Schedule Item Changes	
Satisfied - Item:	Interrogatory Response 9/24/2021
Comments:	
Attachment(s):	CW20191001.pdf Excess Loss Factor Calculations.pdf MO ELF 2022-1-1.xls NCCI_Responses_to_the_Missouri_DCI_Requests_dated_092421.pdf Exhibit 1.pdf Exhibit 2.xlsx

No Form Schedule items changed.

State: Missouri **Filing Company:** NCCI Inc
TOI/Sub-TOI: 16.0 Workers Compensation/16.0004 Standard WC
Product Name: Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022
Project Name/Number: /

Rate Schedule Item Changes					
Item No.	**Exhibit Name**	**Rule # or Page #**	**Rate Action**	**Previous State Filing Number**	**Date Submitted**
1	New Filing		Replacement	342	10/01/2021 By: Nancy Mattei
Previous Version					
1	*New Filing*		*Replacement*	*342*	*08/23/2021* *By: Nancy Mattei*

Response 2

Comments:

Responses are in the Rate/Rule and Supporting Documentation tabs.

Related Objection 2

Comments: Regarding the responses to objection 10 of the questions dated September 1, 2021:
a. Has this process changed from last years filing?

b. Please provide the underlying data and calculations for the following columns in Exhibit 10a:
i. Adjustment to Reverse AOE Credits
ii. Adjustment for Losses Associated with TPA Agreements
iii. Adjustment to Convert Losses from Net to Gross of Deductible
iv. Pct. Of Reported COVID-19-Related Losses to Total Losses

c. Were the same factors mentioned in 2.b. used in last years analysis?

Changed Items:

Supporting Document Schedule Item Changes	
Satisfied - Item:	Interrogatory Response 9/24/2021
Comments:	
Attachment(s):	CW20191001.pdf Excess Loss Factor Calculations.pdf MO ELF 2022-1-1.xls NCCI_Responses_to_the_Missouri_DCI_Requests_dated_092421.pdf Exhibit 1.pdf Exhibit 2.xlsx

State: Missouri **Filing Company:** NCCI Inc
TOI/Sub-TOI: 16.0 Workers Compensation/16.0004 Standard WC
Product Name: Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022
Project Name/Number: /

No Form Schedule items changed.

Rate Schedule Item Changes

Item No.	Exhibit Name	Rule # or Page #	Rate Action	Previous State Filing Number	Date Submitted
1	New Filing		Replacement	342	10/01/2021 By: Nancy Mattei
Previous Version					
1	*New Filing*		*Replacement*	*342*	*08/23/2021* *By: Nancy Mattei*

Response 3

Comments:

Responses are in the Rate/Rule and Supporting Documentation tabs.

Related Objection 3

Comments: Regarding Exhibit 22 that was submitted in response to objection 22 of the questions dated September 1, 2021, please provide the underlying data and calculations for the excess ratios derived in this exhibit.

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Conclusion:

Thank you,
Sincerely,
Nancy Mattei

SERFF Tracking #:	*NCCI-132953901*	***State Tracking #:***	*411*	***Company Tracking #:***	*MISSOURI LC 01012022*

State:	*Missouri*	***Filing Company:***	*NCCI Inc*
TOI/Sub-TOI:	*16.0 Workers Compensation/16.0004 Standard WC*		
Product Name:	*Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022*		
Project Name/Number:	*/*		

Response Letter

Response Letter Status	Submitted to State
Response Letter Date	09/15/2021
Submitted Date	09/15/2021

Dear Patrick Lennon,

Introduction:

Good afternoon,

Response 1

Comments:

Response is in the Supporting Documentation tab.

Related Objection 1

Applies To:

- New Filing, null (Rate)

Comments: DATA:

Have any of the data sources used in determining the Missouri Advisory Loss Costs and Rating Values Filing changed since the previous filing? For example, using data from a different data call to develop expenses.

Changed Items:

Supporting Document Schedule Item Changes	
Satisfied - Item:	Interrogatory Response
Comments:	
Attachment(s):	NCCI_Responses_to_the_Missouri_DCI_Requests_dated_090121.pdf NCCI_Responses_to_the_Missouri_DCI_Requests_dated_090121_Attachments.zip

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 2

Comments:

Response is in the Supporting Documentation tab.

State: Missouri **Filing Company:** NCCI Inc
TOI/Sub-TOI: 16.0 Workers Compensation/16.0004 Standard WC
Product Name: Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022
Project Name/Number: /

Related Objection 2

Applies To:

- New Filing, null (Rate)

Comments: METHODOLOGY:

Please provide the estimated overall impact for each change in methodology from the previous filing.

Changed Items:

Supporting Document Schedule Item Changes	
Satisfied - Item:	Interrogatory Response
Comments:	
Attachment(s):	NCCI_Responses_to_the_Missouri_DCI_Requests_dated_090121.pdf NCCI_Responses_to_the_Missouri_DCI_Requests_dated_090121_Attachments.zip

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 3

Comments:

Response is in the Supporting Documentation tab.

Related Objection 3

Applies To:

- New Filing, null (Rate)

Comments: CATASTROPHE PROVISION:

Please provide support for the selected catastrophe provision (other than Certified Acts of Terrorism) of $0.01 per $100 of payroll in Missouri.

Changed Items:

Supporting Document Schedule Item Changes	
Satisfied - Item:	Interrogatory Response
Comments:	
Attachment(s):	NCCI_Responses_to_the_Missouri_DCI_Requests_dated_090121.pdf NCCI_Responses_to_the_Missouri_DCI_Requests_dated_090121_Attachments.zip

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 4

Comments:

Response is in the Supporting Documentation tab.

Related Objection 4

Applies To:

- New Filing, null (Rate)

Comments: COVID-19-RELATED CLAIMS:

How many COVID-19-related claims were removed from reported loss data in Missouri and Countrywide, and what was the total cost of these claims in Missouri and Countrywide?

Changed Items:

Supporting Document Schedule Item Changes	
Satisfied - Item:	Interrogatory Response
Comments:	
Attachment(s):	NCCI_Responses_to_the_Missouri_DCI_Requests_dated_090121.pdf NCCI_Responses_to_the_Missouri_DCI_Requests_dated_090121_Attachments.zip

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 5

Comments:

Response is in the Supporting Documentation tab.

Related Objection 5

Applies To:
- New Filing, null (Rate)

Comments: WAGE ADJUSTMENT:

How was the 2020 average weekly wage adjusted to exclude the estimated impact of pandemic-related industry-sector mix change?

How was it determined what industry-sector mix changes were expected to return to pre-pandemic levels over time and what changes were expected to persist?

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 6

Comments:

Response is in the Supporting Documentation tab.

Related Objection 6

Applies To:
- New Filing, null (Rate)

Comments: COVID-19-RELATED ADJUSTMENTS

Was it assumed in this analysis that 2022 will mark a return to pre-COVID-19 loss and wage levels, or was there consideration given to the impact of the Delta variant or other variants on claims and economic conditions in 2022?

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 7

Comments:

Response is in the Supporting Documentation tab.

Related Objection 7

Applies To:

- New Filing, null (Rate)

Comments: LOSS DEVELOPMENT FACTORS:

Please provide loss development triangles with at least 10 diagonals for both the voluntary and assigned risk markets separated by indemnity, medical, and DCCE for the past 19 years. In the prior year, this was submitted as Exhibit 4 Development Triangles.xlsx. An updated version of this file will suffice for these purposes.

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 8

Comments:

Response is in the Supporting Documentation tab.

Related Objection 8

Applies To:

- New Filing, null (Rate)

Comments: LOSS DEVELOPMENT FACTORS:

Please provide an Excel file with the specific calculations used to determine Appendix A-II, Section G, column (6) for the most recent year.

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 9

Comments:

Response is in the Supporting Documentation tab.

Related Objection 9

Applies To:

- New Filing, null (Rate)

Comments: LOSS DEVELOPMENT FACTORS:

Please provide an excel file spreadsheet with the specific calculations that provide the derivation of the 0.778 factor in Appendix A-II, Section H, line 2.

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 10

Comments:

Response is in the Supporting Documentation tab.

Related Objection 10

Applies To:

- New Filing, null (Rate)

Comments: AOE AND DCCE RATIOS: Exhibit II Sections A and B Page 46 of 97:

a) Please provide the underlying data and calculations to bring AOE and DCCE to an ultimate level including the development factors, AOE, DCCE, losses, and any other values used to determine the Ultimate AOE and DCCE ratios.
b) Please provide the Ultimate AOE Ratios for MO only data.
c) In the prior years filing, the AOE provision from MO was selected based on a countrywide and MO specific analysis. Was this process still used in this filing?

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 11

Comments:

Response is in the Supporting Documentation tab.

Related Objection 11

Applies To:

- New Filing, null (Rate)

Comments: POLICY YEAR ON-LEVEL FACTORS: Appendix A-I Section A and Section D Pages 48 and 49 of 97:

Please provide the underlying data and calculations to support the factors in column (6).

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 12

Comments:

Response is in the Supporting Documentation tab.

Related Objection 12

Applies To:

- New Filing, null (Rate)

Comments: POLICY YEAR ON-LEVEL FACTORS: Appendix A-I Section A and Section D Pages 48 and 49 of 97:

Please provide the underlying data and calculations to support the factors in column (7). More specifically, how is the targeted off-balance factor of 0.952 determined?

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 13

Comments:

Response is in the Supporting Documentation tab.

Related Objection 13

Applies To:

- New Filing, null (Rate)

Comments: INDUSTRY GROUP DIFFERENTIALS:

Appendix A-IV Section I Page 63 of 97: Please show the calculations underlying the factors in Col (4) and Col (5).

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 14

Comments:

Response is in the Supporting Documentation tab.

Related Objection 14

Applies To:

- New Filing, null (Rate)

Comments: LIMITED LOSS DEVELOPMENT FACTORS: Appendix B-I Section I Page 66 of 97:

Please provide underlying data and calculations for how the Likely-to-Develop and Not-Likely-to-Develop columns are calculated.

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 15

Comments:

Response is in the Supporting Documentation tab.

Related Objection 15

Applies To:

- New Filing, null (Rate)

Comments: TREND: Page 62 of 97 (Appendix A-III).

Provide the underlying data, fits, assumptions, calculations, selections and rationale of the selection of the indemnity and medical trend factors. Please include an update of the excel file provided last year entitled Exhibit 14 Supplemental Loss Development and Trend.

Please include fifteen years of information including:
Lost-Time claim frequency and severity based on data in excess of wage inflation
Claim counts
Premium
Limited indemnity losses
Limited medical losses

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 16

Comments:

Response is in the Supporting Documentation tab.

Related Objection 16

Applies To:

- New Filing, null (Rate)

Comments: F-CLASS COUNTRYWIDE PURE PREMIUM TREND: Appendix B-IV Part 1 Section A.2, Page 77 of 97:

Why are the current annual trends of 0.980 and 0.990 for indemnity and medical, respectively, used to trend losses rather than the selected trends of 0.975 and 0.985?

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 17

Comments:

Response is in the Supporting Documentation tab.

Related Objection 17

Applies To:

- New Filing, null (Rate)

Comments: F-CLASS COUNTRYWIDE PURE PREMIUM AND RELATIVITIES: Appendix B-IV Part I Section C Page 79 of 97:

Please provide the underlying data, assumptions, and calculations used to determine Missouris index to Countrywide factor of .684.

Please provide the data and calculations described on steps 1 to 5 for Missouri.

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 18

Comments:

Response is in the Supporting Documentation tab.

Related Objection 18

Applies To:

- New Filing, null (Rate)

Comments: F-CLASS COUNTRYWIDE PURE PREMIUM AND RELATIVITIES: Appendix B-IV Part I Section D Page 79 of 97:

Please provide the underlying data, assumptions, and calculations used to determine the 10-Year Expected Unlimited Countrywide Losses in Col (2).

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 19

Comments:

Response is in the Supporting Documentation tab.

Related Objection 19

Applies To:

- New Filing, null (Rate)

Comments: F-CLASS COUNTRYWIDE PURE PREMIUM AND RELATIVITIES: Appendix B-IV Part I Section D Page 79 of 97:

Regarding Col (4), what is considered a limited amount of data that would equate to a class code having their relativity set to 1.000 per the footnote?

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 20

Comments:

Response is in the Supporting Documentation tab.

Related Objection 20

Applies To:

- New Filing, null (Rate)

Comments: F-CLASS COUNTRYWIDE PURE PREMIUM AND RELATIVITIES: Appendix B-IV Part II Section A.1 Page 80 of 97:

Please provide the underlying data and calculations for the State Act Pure Premium Relativity Factor of 1.462.

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 21

Comments:

Response is in the Supporting Documentation tab.

Related Objection 21

Applies To:

- New Filing, null (Rate)

Comments: F-CLASS COUNTRYWIDE PURE PREMIUM AND RELATIVITIES: Appendix B-IV Part II Section B.4. Page 80 of 97:

Please provide the underlying data and calculations for the Federal Act Loss-Based Assessment of 1.115.

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 22

Comments:

Response is in the Supporting Documentation tab.

Related Objection 22

Applies To:

- New Filing, null (Rate)

Comments: F-CLASS EXCESS RATIOS: Appendix B-IV Section B Page 78 of 97:

Please provide the underlying data and calculations to support the Excess Ratios in Row (1).

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 23

Comments:

Response is in the Supporting Documentation tab.

Related Objection 23

Applies To:

- New Filing, null (Rate)

Comments: F-CLASS COUNTRYWIDE PURE PREMIUM AND F-CLASS COD RELATIVITIES:

Why were relativities for class codes with limited data set to 1.000 rather than credibility weighting or similar?

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 24

Comments:

Response is in the Supporting Documentation tab.

Related Objection 24

Applies To:

- New Filing, null (Rate)

Comments: F-CLASS LIMITED LOSS DEVELOPMENT FACTORS: Appendix B-IV Section 3 Page 78 of 97:

Please explain why the losses developed to an ultimate basis using loss development factors based on country wide data excludes data from Texas.

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 25

Comments:

Response is in the Supporting Documentation tab.

Related Objection 25

Applies To:
- New Filing, null (Rate)

Comments: F-CLASS POLICY PERIOD:

Why do the Policy Periods found in Appendix B-IV only go up to Policy Year 2017 and not Policy Year 2019 like the other Policy Periods in the filing?

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 26

Comments:

Response is in the Supporting Documentation tab.

Related Objection 26

Applies To:
- New Filing, null (Rate)

Comments: VOLUNTARY MARKET INDICATION:

Please provide the indication as of 1/1/2022 if all assigned risk experience was excluded.

Please provide these calculations in an excel file and include all the underlying components that will change because they are based on only voluntary experience, such as loss development, trend, LAE, etc.

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 27

Comments:

Response is in the Supporting Documentation tab.

Related Objection 27

Applies To:
- New Filing, null (Rate)

Comments: SMALL CLASSES:

Please provide any updates on class ratemaking research, status and results, or stability performance results on tests of the performance of the recently implemented small class ratemaking project intended to address the stability of the small classes.

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 28

Comments:

Response is in the Supporting Documentation tab.

Related Objection 28

Applies To:

- New Filing, null (Rate)

Comments: CLASSIFICATION:

Please provide an Excel file with seven columns of information. The first column should be the class code, the second column should be the exposures by class code, the third column should be the current advisory loss cost, the fourth column should be the proposed advisory loss cost by class code and the last three columns should be the percentage loss cost changes effective 2022, 2021, and 2020 by class code. Include totals in columns 4, 5 and 6 and please exclude discontinued classes. This file was submitted as Exhibit 18 Loss Cost Comparison.xlsx in last years filing.

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

No Rate/Rule Schedule items changed.

Response 29

Comments:

Response is in the Supporting Documentation tab.

Related Objection 29

Applies To:

- New Filing, null (Rate)

Comments: VOLUNTARY MARKET AND ASSIGNED RISK PLANS:

Please confirm that the indication provided in Exhibit I is an indication for the voluntary market but that the data upon which it is based is on combined voluntary and assigned risk plan losses. If not, please explain.

Please confirm that although the voluntary indications are based on combined voluntary and assigned risk plan data, that you are not providing loss costs or rates for the assigned risk market

Changed Items:

No Supporting Documents changed.

No Form Schedule items changed.

SERFF Tracking #:	NCCI-132953901	**State Tracking #:**	411	**Company Tracking #:**	MISSOURI LC 01012022

State:	Missouri	**Filing Company:**	NCCI Inc
TOI/Sub-TOI:	16.0 Workers Compensation/16.0004 Standard WC		
Product Name:	Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022		
Project Name/Number:	/		

No Rate/Rule Schedule items changed.

Conclusion:

Thank you,

Sincerely,

Nancy Mattei

State: Missouri **Filing Company:** NCCI Inc
TOI/Sub-TOI: 16.0 Workers Compensation/16.0004 Standard WC
Product Name: Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022
Project Name/Number: /

Note To Reviewer

Created By:

Nancy Mattei on 09/02/2021 01:56 PM

Last Edited By:

Patrick Lennon

Submitted On:

11/01/2021 09:33 AM

Subject:

Objection Response Extension

Comments:

Good afternoon,

We appreciate the extension for a response to this objection. We will respond by 9/15/2021.

Thank you,

SERFF Tracking #:	*NCCI-132953901*	***State Tracking #:***	*411*	***Company Tracking #:***	*MISSOURI LC 01012022*

State:	*Missouri*	***Filing Company:***	*NCCI Inc*
TOI/Sub-TOI:	*16.0 Workers Compensation/16.0004 Standard WC*		
Product Name:	*Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022*		
Project Name/Number:	*/*		

Rate Information

Rate data applies to filing.

Filing Method:	SERFF
Rate Change Type:	Decrease
Overall Percentage of Last Rate Revision:	1.000%
Effective Date of Last Rate Revision:	01/01/2021
Filing Method of Last Filing:	SERFF
SERFF Tracking Number of Last Filing:	NCCI-132488376

Company Rate Information

Company Name:	Overall % Indicated Change:	Overall % Rate Impact:	Written Premium Change for this Program:	Number of Policy Holders Affected for this Program:	Written Premium for this Program:	Maximum % Change (where req'd):	Minimum % Change (where req'd):
NCCI Inc	-7.700%	0.000%	$0	0	$0	19.800%	-28.000%

SERFF Tracking #:	*NCCI-132953901*	***State Tracking #:***	*411*	***Company Tracking #:***	*MISSOURI LC 01012022*

State:	*Missouri*	***Filing Company:***	*NCCI Inc*
TOI/Sub-TOI:	*16.0 Workers Compensation/16.0004 Standard WC*		
Product Name:	*Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022*		
Project Name/Number:	*/*		

Rate/Rule Schedule

Item No.	Schedule Item Status	Exhibit Name	Rule # or Page #	Rate Action	Previous State Filing Number	Attachments
1	REVIEWED 11/01/2021	New Filing		Replacement	342	MO 1-1-2022 Filing.pdf Exhibit 1.pdf Exhibit 2.xlsx

SERFF Tracking #:	NCCI-132953901	**State Tracking #:**	411	**Company Tracking #:**	MISSOURI LC 01012022

State:	Missouri	**Filing Company:**	NCCI Inc
TOI/Sub-TOI:	16.0 Workers Compensation/16.0004 Standard WC		
Product Name:	Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022		
Project Name/Number:	/		

Attachment Exhibit 2.xlsx is not a PDF document and cannot be reproduced here.

Missouri

Advisory Loss Costs and Rating Values Filing

Proposed Effective January 1, 2022

Carla Townsend, WCP
Regulatory Division

(P) 561-893-3819 (F) 561-893-5779
Email: Carla_Townsend@ncci.com

August 23, 2021

The Honorable Chlora Lindley-Myers
Director
Missouri Department of Commerce and Insurance
Harry S Truman State Office Building
301 W. High St., Room 530
Jefferson City, Missouri 65101

Re: Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022

Dear Director Lindley-Myers:

In accordance with the applicable statutes and regulations of the state of Missouri, we are filing advisory voluntary loss costs and rating values to be effective January 1, 2022 for new and renewal policies.

Enclosed are NCCI's Voluntary Loss Costs Including Trend proposed to be effective January 1, 2022. The proposed loss costs represent an overall average change of -7.7% from the current, similar set of loss costs that have been in effect since January 1, 2021.

Reported COVID-19-related claims have been excluded from the data on which this filing is based because those claims are not expected to be predictive of the loss experience that may arise during the filing prospective period. After an in-depth review and analysis, NCCI has determined that its standard ratemaking methodologies continue to remain appropriate for use in this year's filing.

I hereby certify that I am familiar with Missouri's insurance laws, rules, and regulations, and to the best of my knowledge, information, and belief, this filing complies in all respects to such laws, rules, and regulations. This filing is made on behalf of the members and subscribers of the National Council on Compensation Insurance, Inc., who are writing or will write workers compensation insurance in Missouri.

This filing is made exclusively on behalf of the companies that have given valid consideration for the express purpose of fulfilling regulatory rate or pure premium filing requirements and other private use of this information.

In the enclosed is a list of companies, which as of the time this filing is submitted, are eligible to reference this information. The inclusion of a company on this list merely indicates that the company, or the group to which it belongs, is affiliated with NCCI in this state, or has licensed this

information as a non-affiliate, and is not intended to indicate whether the company is currently writing business or is even licensed to write business in this state.

Please contact me if you have any questions or need further information.

Sincerely,

National Council on Compensation Insurance, Inc.

Carla Townsend, WCP
State Relations Executive

MISSOURI

Advisory Loss Costs and Rating Values Filing – January 1, 2022

Actuarial Certification

I, Brett Foster, am a Director and Actuary for the National Council on Compensation Insurance, Inc. I am a Fellow of the Casualty Actuarial Society and a member of the American Academy of Actuaries, and I meet the Qualification Standards of the American Academy of Actuaries to provide the actuarial report contained herein.

The information contained in this report has been prepared under my direction in accordance with applicable Actuarial Standards of Practice as promulgated by the Actuarial Standards Board. The Actuarial Standards Board is vested by the U.S.-based actuarial organizations with the responsibility for promulgating Actuarial Standards of Practice for actuaries providing professional services in the United States. Each of these organizations requires its members, through its Code of Professional Conduct, to observe the Actuarial Standards of Practice when practicing in the United States.

Brett Foster, FCAS, MAAA
Director and Actuary
Actuarial and Economic Services

MISSOURI

Advisory Loss Costs and Rating Values Filing – January 1, 2022

Disclosures

Purpose of the Report

The purpose of this report is to provide the proposed voluntary loss costs for workers compensation policies in Missouri, proposed to be effective January 1, 2022. The intended users of this report are:

- The Missouri Department of Insurance, Financial Institutions and Professional Registration
- Affiliated carriers, for their reference in determining workers compensation rates

Scope

The prospective loss costs are intended to cover the indemnity and medical benefits provided under the system, as well as some of the expenses associated with providing these benefits (loss adjustment expenses). They do not, however, contemplate any other costs associated with providing workers compensation insurance (such as commissions, taxes, etc.).

Each insurance company offering workers compensation insurance in Missouri that uses NCCI loss costs may file a loss cost multiplier to be applied to the advisory prospective loss costs in order to compute the final workers compensation rates they intend to charge. This multiplier is intended to cover the other costs associated with providing workers compensation insurance that are not already part of the advisory prospective loss costs.

Data Sources and Dates

The overall average loss cost level change is based on a review of Financial Call Data, which is an aggregation of workers compensation data annually reported to NCCI. In this filing, Financial Call Data submissions received after June 24, 2021 were not considered for inclusion in the analysis.

Loss cost level changes at the classification code level are based on Unit Statistical Plan Data, which is the audited exposure, premium and loss information reported to NCCI on a policy level. In this filing, Unit Statistical Plan Data submissions received after June 22, 2021 were not considered for inclusion in the analysis.

NCCI categorizes catastrophic events as those that incur aggregate workers compensation losses in excess of $50 million per occurrence. NCCI's standard ratemaking methodology excludes catastrophe-related losses from the calculation of loss costs, since these events are not considered to be predictive of future experience. NCCI is proposing to treat the COVID-19 pandemic as a catastrophic event and, therefore, the losses from reported COVID-19-related

claims have been excluded from the underlying data in this year's analysis because those claims are not expected to be predictive of the loss experience that may arise during the filing prospective period.

In some areas, NCCI's analysis also relies on other data sources, which are reviewed for reasonableness and are referenced in the filing where applicable.

This filing was prepared as of July 27, 2021. Therefore, events that occurred after this date that may have a material impact on workers compensation costs in this jurisdiction have not been considered in the analysis.

NCCI maintains several data reporting initiatives and programs to assist carriers to report data and to ensure that the data that is reported to NCCI is complete, accurate, and reported in a timely fashion. Occasionally, a carrier's data submission is not available for use in an NCCI filing either because the data was not reported prior to the filing, had quality issues, or NCCI determined that the data that was reported should not be included in the filing based on NCCI's actuarial judgment. In this year's filing, data for all carriers writing at least one-tenth of one percent of the Missouri workers compensation written premium volume have been included in the experience period on which this filing is based.

Risks and Uncertainty

This filing includes assumptions and projections concerning the future. As with any prospective analysis, there exists estimation uncertainty in these assumptions and projections. Areas of this analysis subject to estimation uncertainty that could have a material impact on the final results include the following:

- Projection of future loss development
- Selection of loss ratio trends
- Potential impact of changes to laws and/or regulations

In addition, any future changes to workers compensation law or regulations that apply retroactively to policies or benefit claims on policies in the proposed effective period may have a significant impact on the adequacy of the loss costs proposed in this filing.

The course of the COVID-19 pandemic and related considerations, such as future economic conditions and the labor market, contribute additional uncertainty when estimating future costs. After an in-depth review and analysis of NCCI's general ratemaking methodologies, NCCI has determined that those approaches remain appropriate for use in this filing.

MISSOURI

Advisory Loss Costs and Rating Values Filing – January 1, 2022

Table of Contents

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Advisory Loss Costs and Rating Values Filing – January 1, 2022

Part 1 Filing Overview

- Overview of Methodology
- Summary of Selections
- Selections Underlying the Proposed Changes
- Additional Proposed Changes

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Advisory Loss Costs and Rating Values Filing – January 1, 2022

Overview of Methodology

Based on its review of the most recently available data, NCCI has proposed an overall average workers compensation voluntary market loss cost level change of -7.7% to become effective January 1, 2022.

Key Components

Experience, Trend and Benefit Change	-7.9%
Change in Loss-Based Expenses	+0.2%
Proposed Overall Average Voluntary Loss Cost Level Change	**-7.7%**

Here are some key observations:

- The filing is based on premium and loss experience for Policy Years 2018 and 2019. Policy Year 2019's experience is comparatively more favorable than that for Policy Year 2018.
- Missouri's lost-time claim frequency continues to show a long-term pattern of decline.
- After adjusting to a common wage level, Missouri's average medical cost per lost-time claim has decreased in Policy Year 2019, contrary to the upward trend observed in recent years.
- The loss cost change varies by classification code, each of which belongs to one of five industry groups. The average change by industry group ranges from -8.7% for Contracting to -6.3% for Office and Clerical.

Additional Notable Changes Proposed in the Filing:

- Catastrophic Handling of the COVID-19 Pandemic
- Federal-Classification (F-Class) Ratemaking
- Calendar Year 2020 Wage Adjustment

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Advisory Loss Costs and Rating Values Filing – January 1, 2022

Overview of Methodology

Aggregate Ratemaking

NCCI's approach to determining the proposed overall average loss cost level change utilizes widely accepted ratemaking methodologies. The approach employed in this filing includes the following steps:

- The reported historical premium totals are projected to an ultimate basis and adjusted to the current pure premium level
- The excess loss portion of individual large claims are removed from reported aggregate losses, based on a Missouri-specific large loss threshold
- The reported historical limited indemnity and medical loss totals are projected to an ultimate basis and adjusted to the current benefit level
- Ratios of losses to pure premium are projected to the cost levels expected in the loss cost effective period
- Ultimate, trended, limited losses are adjusted to an unlimited basis via a non-catastrophe excess ratio (with excess ratios at limits beyond $50 million set equal to zero)
- Proposed benefit level and/or expense changes are applied to the projected cost ratios

The indicated average loss cost level change is calculated for the years in the filing's experience period. If the final projected cost ratios are greater (less) than 1.000, then an increase (decrease) in the average loss cost level is indicated.

Class Ratemaking

Once the proposed overall average voluntary loss cost level change has been determined, NCCI separately determines loss costs per $100 of payroll for each workers compensation job classification (class); the loss costs and year-over-year changes vary by class. Three sets of pure premiums are combined as part of each class code's loss cost calculation based on the volume of available data for that job classification. The three sets of pure premiums are:

- State-specific payroll and loss experience ("indicated")
- Current pure premium adjusted to the proposed level ("present on rate level")
- Countrywide experience adjusted to state conditions ("national")

Note: The methodology and assumptions used in this filing may not be applicable to or relevant for another purpose, including but not limited to NCCI filings in other jurisdictions.

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Advisory Loss Costs and Rating Values Filing – January 1, 2022

Summary of Selections

The following is a summary of selections underlying the most recent two Missouri voluntary loss cost filings.

Voluntary Loss Costs	Effective January 1, 2021	Effective January 1, 2022
Experience Period	Policy Years 2017 and 2018	Policy Years 2018 and 2019
Premium Development	Three-year average	Three-year average
Basis of Loss Experience	Average of Paid and Paid+Case losses	Average of Paid and Paid+Case losses
Paid Loss Development	Two-year average	Two-year average
Paid+Case Loss Development	Five-year average	Five-year average
Tail Factors	Selected	Selected
Indemnity Annual Loss Ratio Trend Factor	0.980	0.975
Medical Annual Loss Ratio Trend Factor	0.990	0.985
Loss Adjustment Expense Provision	19.3%	19.5%
Base Threshold for Limiting Losses	$9,919,089	$10,057,697
Large Loss Excess Ratio	1.1%	1.1%*
Classification Swing Limits (applied by Industry Group)	+/−20%	+/−20%

*The proposed value reflects the updated hazard group assignment changes as detailed in the approved Item Filing B-1442.

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Advisory Loss Costs and Rating Values Filing – January 1, 2022

Selections Underlying the Proposed Changes

Experience and Development

NCCI analyzed the emerging experience of Missouri workers compensation policies in recent years. The primary focus of our analysis was on premiums and losses from Policy Years 2018 and 2019 evaluated as of December 31, 2020. The most recently available full policy year is 2019 since the last policy had an effective date of December 31, 2019 and did not expire until December 31, 2020. During this year's analysis, which included an assessment of pandemic claim-related impacts, the use of the two most recently available full policy years of data was selected as most appropriate in terms of providing balance between stability and responsiveness.

Different aggregations of loss experience were analyzed in preparation of this filing. These were (i) paid losses (benefit amounts already paid by insurers on reported claims) and (ii) the sum of paid losses plus case reserves (paid losses and the amounts set aside to cover future payments on those claims). In this filing, NCCI utilized loss development factors based on each of these two loss aggregations. This is consistent with NCCI filings made in the past several years in Missouri. Loss development factors are needed since paid losses and case reserve estimates on a given claim change over time until the claim is finally closed. The loss development factors are based on how paid losses and case reserve estimates changed over time for claims from older years. The specific development link ratio selections underlying this filing are shown below:

- A three-year average of historical premium development factors
- A two-year average of historical paid loss development factors through a 19th report
- A five-year average of historical paid plus case loss development factors through a 19th report
- Loss development tail factors from a 19th report to ultimate were selected based on a review of the ten most recently available factors

After analysis and consideration of the most recent data, and the assessment of COVID-19 impacts, NCCI has determined that its standard development procedures and methodologies remain appropriate.

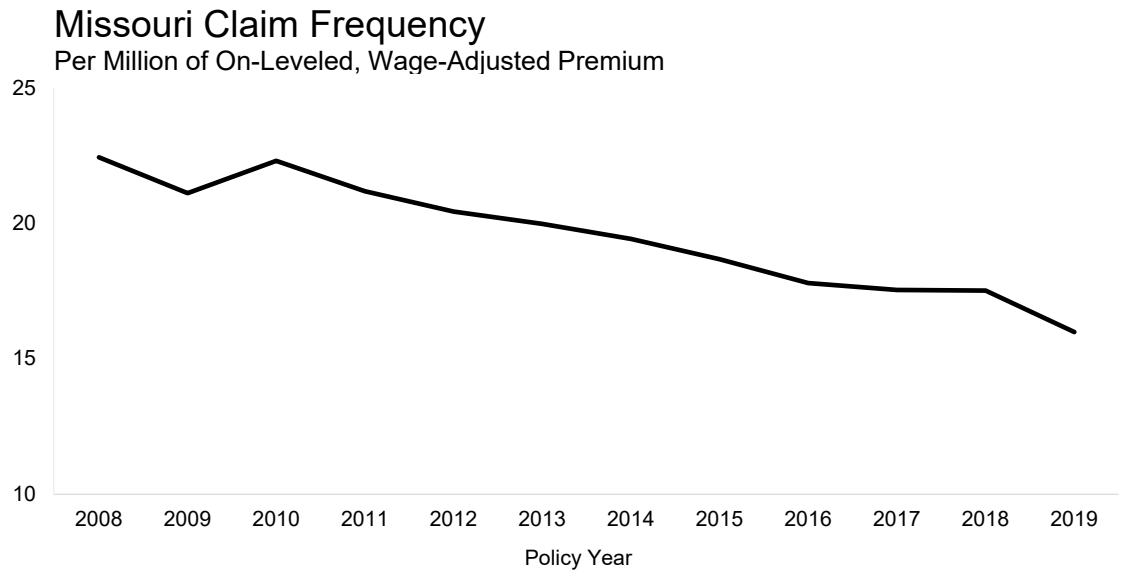
Trend

This filing relies primarily on the experience from Policy Years 2018 and 2019. However, the proposed loss costs are intended for use with policies with effective dates on and after January 1, 2022. It is necessary to use trend factors that forecast how much the future Missouri workers compensation experience will differ from the past. These trend factors measure anticipated changes in the amount of indemnity and medical benefits as compared with anticipated changes

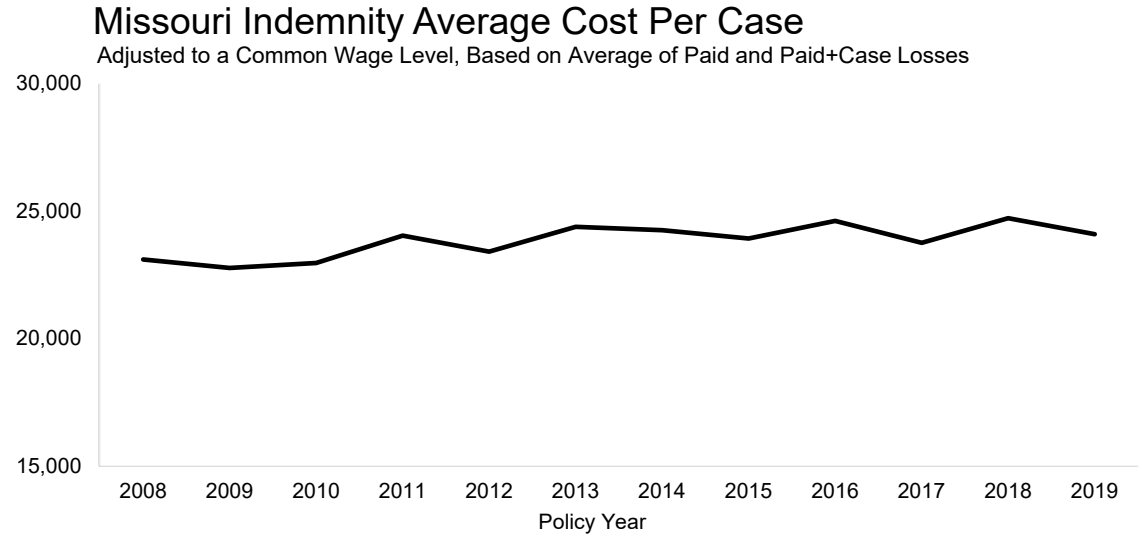
in the amount of workers' wages. For example, if benefit costs are expected to grow faster than wages, then a trend factor greater than zero is indicated. Conversely, if wages are expected to grow faster than benefit costs, then a trend factor less than zero is indicated. While historical changes in claim frequency and average cost per case were also reviewed, NCCI applies loss ratio trend factors in the determination of the proposed overall average loss cost level change.

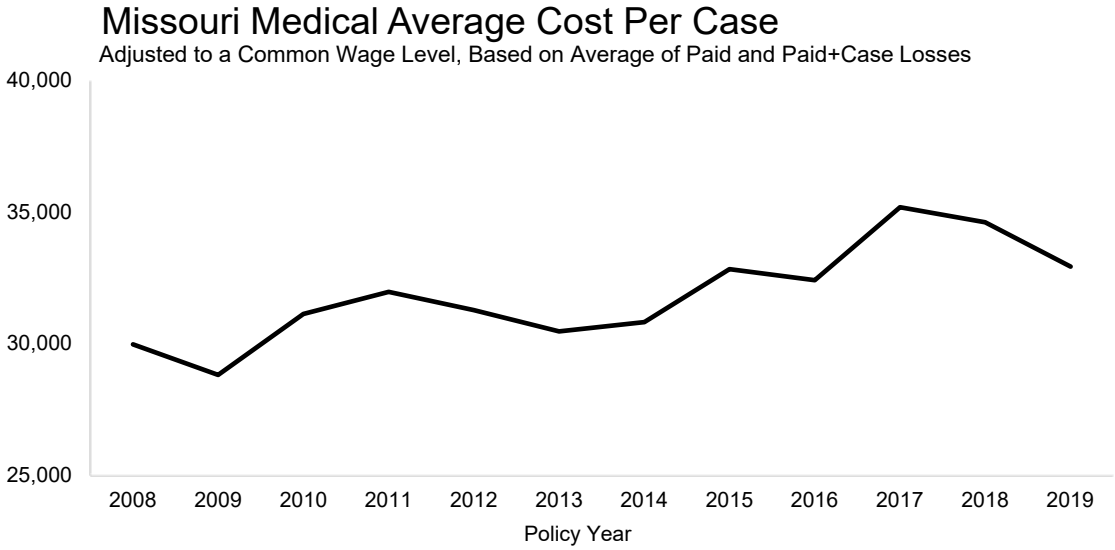
After analysis and consideration of the most recent data, and the assessment of COVID-19 impacts, NCCI has determined that its standard trend procedures and methodologies remain appropriate.

The following few charts show a measure of the number of workplace injuries (claim frequency) and the average cost of each of these injuries (claim severity).



Missouri's lost-time claim frequency has generally declined since 2008.

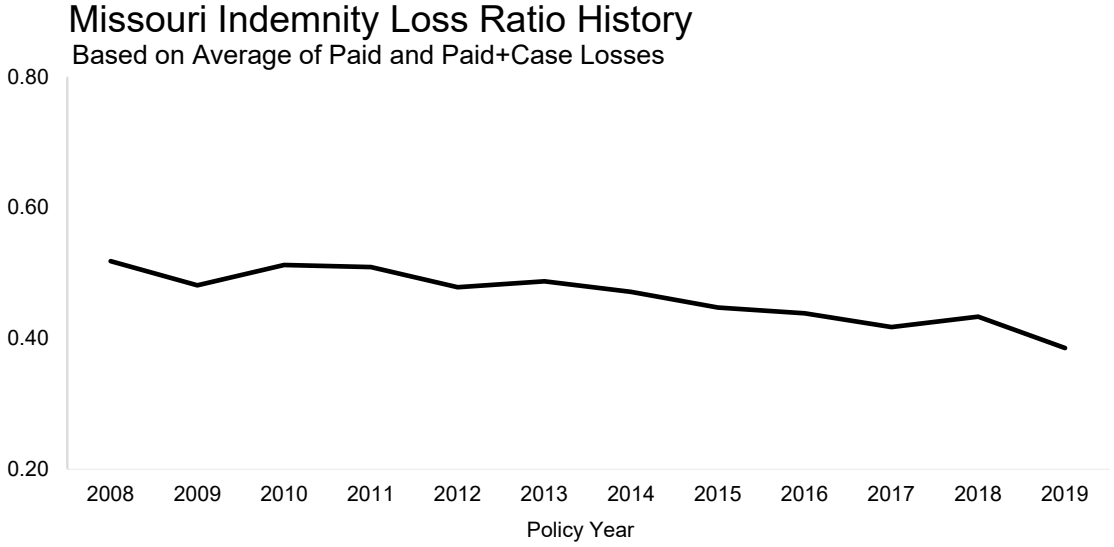


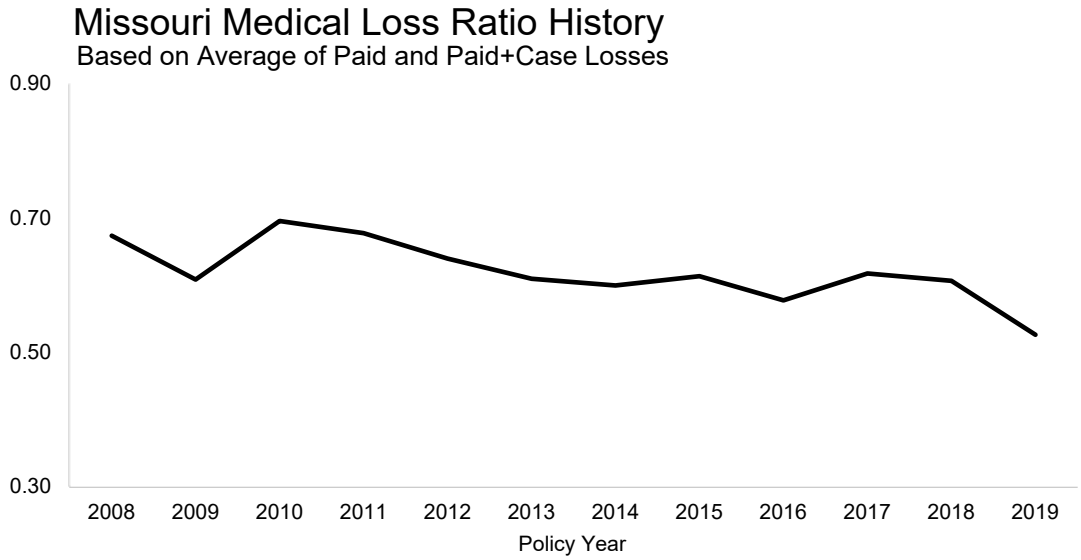


As these two charts illustrate, the average indemnity cost per lost-time claim has remained relatively stable in recent years compared to wage growth and the average medical cost per lost-time claim has decreased in Policy Year 2019, contrary to the upward trend observed in recent years.

Selections Underlying the Proposed Changes

Loss ratios result after combining observed changes in Missouri's average claim frequency with corresponding changes in Missouri's average cost per case.





Based on our analysis this year, we are proposing to decrease the current annual indemnity loss ratio trend of −2.0% to −2.5% and to decrease the annual medical loss ratio trend of −1.0% to −1.5%.

Selections Underlying the Proposed Changes

Loss-Based Expenses

The proposed loss costs include a provision for loss adjustment expenses (LAE). These are expenses associated with the handling of workers compensation claims. LAE is included in the loss costs by using a ratio of loss adjustment expense dollars to loss dollars (called the LAE provision). In this filing, NCCI is proposing to change the current voluntary LAE provision from 19.3% to 19.5% of losses.

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Advisory Loss Costs and Rating Values Filing – January 1, 2022

Additional Proposed Changes

Catastrophic Handling of the COVID-19 Pandemic

Overview

NCCI recently reviewed its actuarial catastrophe methodology as a result of the COVID-19 pandemic. In the calculation of loss costs, NCCI is proposing to use data that excludes the impact of the catastrophic COVID-19 event. Under this approach, NCCI would account for future exposure to all catastrophic perils, including pandemics, through the Catastrophe (other than Certified Acts of Terrorism) Provision.

In Item Filing 02-MO-2021, NCCI proposes to establish a Catastrophe (other than Certified Acts of Terrorism) Provision defined as "[a] single event or peril resulting in a group of claims with aggregate workers compensation losses in excess of $50 million. This $50 million threshold applies per occurrence, across all states for which claims arise from a single event or peril." This handling recognizes that there are multiple catastrophic exposures (which may include pandemics) on workers compensation system costs that should be considered in the calculation of loss costs in adherence with the Actuarial Standards of Practice (ASOPs). The proposed Catastrophe (other than Certified Acts of Terrorism) loss cost per $100 of payroll in Missouri is $0.01.

Background

The COVID-19 pandemic has shown that pandemics have the potential to be a catastrophic peril on workers compensation system costs. In this filing, COVID-19 is being treated as a catastrophe and all reported data from COVID-19 pandemic claims have been excluded from ratemaking to better reflect the conditions likely to prevail in the filing's proposed effective period beginning on August 1, 2022.

Both the definition of catastrophe and the treatment of catastrophe losses in property and casualty ratemaking are addressed in the Actuarial Standards of Practice (ASOP). As defined in ASOP 39 ("Treatment of Catastrophe Losses in Property/Casualty Insurance Ratemaking"), a catastrophe is "a relatively infrequent event or phenomenon that produces unusually large aggregate losses." ASOP 39 also states that "consideration should be given to the impact of catastrophes and that procedures should be developed to include an allowance for catastrophe exposure in the rate." In the calculation of loss costs, NCCI uses ratemaking data that excludes the impact of catastrophes because the full unadjusted impact of the catastrophe experience is not considered predictive on a prospective basis.

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Advisory Loss Costs and Rating Values Filing – January 1, 2022

Additional Proposed Changes

The COVID-19 pandemic has shown that there are perils that can result in catastrophic losses and that regardless of the specific peril, any event exceeding $50 million should be removed from the data used in ratemaking. In Item Filing 02-MO-2021, NCCI has filed an advisory Catastrophe (other than Certified Acts of Terrorism) Provision to contemplate a single event or peril resulting in a group of claims with aggregate workers compensation losses in excess of $50 million. The proposed advisory Catastrophe (other than Certified Acts of Terrorism) loss cost per $100 of payroll in Missouri is $0.01. This provision recognizes that there are multiple potentially catastrophic perils with exposure on workers compensation system costs.

Carriers charging the Catastrophe (other than Certified Acts of Terrorism) advisory loss cost/rate of $0.01 per $100 of payroll would collect additional premium to account for exposure to catastrophic risks. This premium charge is not used by NCCI in ratemaking or experience rating/merit rating. Note: The loss cost catastrophe provision is not a final rate, as it does not include provisions for all expense-related components.

Establishing the Catastrophe (Other Than Certified Acts of Terrorism) Premium Endorsement

In Item Filing 02-MO-2021, NCCI proposes to establish the Catastrophe (Other Than Certified Acts of Terrorism) Premium Endorsement in NCCI's ***Forms Manual of Workers Compensation and Employers Liability Insurance (Forms Manual)*** and to define "Catastrophe (other than Certified Acts of Terrorism)" as "[a] single event or peril resulting in a group of claims with aggregate workers compensation losses in excess of $50 million. This $50 million threshold applies per occurrence, across all states for which claims arise from a single event or peril." This item is proposed to become effective for new and renewal policies effective on and after 12:01 a.m. August 1, 2022. This lead time will provide insurance companies ample time to incorporate the new endorsement into their processes.

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Advisory Loss Costs and Rating Values Filing – January 1, 2022

Additional Proposed Changes

Federal-Classification (F-Class) Ratemaking

This filing proposes to revise the current approach used to determine the loss costs for those classification codes that are subject to the benefits provided under the United States Longshore and Harbor Workers Compensation Act (USL&HW Act). The proposed approach has several advantages over the current methodology that has been in effect, without significant changes, for more than 20 years. These advantages include:

- Greater year-to-year stability in loss costs
- A simplified ratemaking approach
- Direct recognition that federal act USL&HW benefits are the same across jurisdictions

For reference, the F-classifications in Missouri have a total of $19 million in payroll in the latest policy period used in this filing; this represents less than 0.1% of Missouri's total payroll.

The USL&HW Act is a federal law that provides indemnity and medical benefits to employees such as longshore workers, harbor workers, ship repair workers, shipbuilders, and other employees who perform the loading, unloading, repairing, or building of a vessel or dock. It applies to such employees while working on US navigable waters and while working on any adjoining pier, wharf, dry dock, terminal, building way, marine railway, or other area adjoining such navigable waters customarily used for the loading, unloading, repairing, or building of a vessel. It does not cover masters or members of the crew of a vessel.

An injured F-class worker (or beneficiary) may receive state or federal act benefits, based on the exposure at the time of the accident. While federal and state act losses are reported separately, payroll is reported on a combined basis. Therefore, F-class loss costs must reflect both state and federal act benefits.

In the past, updates were made to NCCI's general class ratemaking methodology, which have increased the year-to-year stability for the F-class codes. Even so, relative to the industrial codes, the F-class codes have generally exhibited a higher level of volatility associated with their lower volume of data.

NCCI recently completed a review of the current F-class methodology. The proposed F-class approach incorporates a countrywide pure premium based on 10 policy years of F-class data, state-specific benefit relativities, and F-class code relativities.

The proposed approach recognizes that F-class experience across all jurisdictions consists primarily of federal act benefits. These benefits are based on a federal benefit structure and are subject to a federal medical fee schedule—neither of which vary by individual jurisdiction.

Additional Proposed Changes

Accordingly, the proposed methodology leverages this consistency by combining the data at a countrywide level—rather than relying on smaller volumes of state-specific data during the F-class ratemaking process. This change, alongside the expansion to 10 policy years of data, helps increase the stability of these low volume and unique classifications.

The state act benefits portion of the reported F-class experience is initially adjusted to a countrywide level and then back down to a state level using industrial codes' data as a proxy. This allows a greater volume of combined data to be used in the F-class ratemaking process as well as retaining the ability to directly reflect state-specific cost differences.

For more details, refer to Appendix B-IV.

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Advisory Loss Costs and Rating Values Filing – January 1, 2022

Additional Proposed Changes

Calendar Year 2020 Wage Adjustment

NCCI's standard methodology is to adjust frequency and severity values included in its loss cost filings to a common wage level before analyzing trends that may be present in those values. This practice allows NCCI to analyze trends above and beyond changes that may be due solely to wage inflation. More specifically, in this year's filing, the frequency and severity adjustments would have incorporated the state's estimated Calendar Year 2020 average weekly wage (AWW) level using data from the Bureau of Labor Statistics' Quarterly Census of Employment and Wages (QCEW).

In addition to the traditional growth in wages/salaries that may be expected to occur each year, the observed change in the 2019-to-2020 AWW was also impacted by COVID-19-related shifts in employment across industry sectors. While a change in industry-sector mix occurs to a small degree each year, its impact on the 2020 AWW change was unusually large, due to pandemic-related job losses in relatively low wage industries, and ignoring this effect would otherwise distort the intended nature of the adjustment. Therefore, in this year's ratemaking analysis the 2020 AWW value was adjusted to exclude the estimated impact of the pandemic-related, industry-sector mix change.

This adjustment is reflected in the frequency and severity values shown in Appendix A-III Trend Factors. The impact of the AWW adjustment is expected to be immaterial.

Part 2 Proposed Values

- Proposed Voluntary Loss Costs and Rating Values
- Proposed Values for Inclusion in the Experience Rating Plan Manual
- Proposed Values for Inclusion in the Retrospective Rating Plan Manual

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Advisory Loss Costs and Rating Values Filing – January 1, 2022

Proposed Voluntary Loss Costs and Rating Values

The following pages include proposed voluntary loss costs and rating values:

- Voluntary loss costs, expected loss rates, and d-ratios by class code, along with associated footnotes

- Advisory miscellaneous values, such as:

    - Advisory loss elimination ratios
    - Maximum weekly payroll applicable for select class codes
    - Premium determination for Executive Officers, Members of Limited Liability Companies, Partner and Sole Proprietors
    - Terrorism advisory loss cost
    - United States Longshore and Harbor Workers' Compensation Coverage Percentage

- Summary description of expected loss rates and d-ratios

Please note the following in connection with this filing:

- As a result of Item B-1397, effective January 1, 2008, a single combined loss cost is still calculated for Class Codes 7710 and 7711 via a payroll-weighted average of the separately indicated loss costs for these two class codes.
- As a result of Item B-1439, effective January 1, 2021:
    - Class Codes 2683 and 2501 are combined to reflect the final year of a two-year transition program, and Class Code 2683 is discontinued.
    - Class Codes 3240 and 3257 are combined to reflect the final year of a two-year transition program, and Class Code 3240 is discontinued.
- As a result of Item B-1442, effective January 1, 2022, class code hazard group changes were incorporated.
- As a result of Item R-1419, the retrospective rating plan parameters are updated.

Effective January 1, 2022

CLASS CODE	LOSS COST	ELR	D RATIO	CLASS CODE	LOSS COST	ELR	D RATIO	CLASS CODE	LOSS COST	ELR	D RATIO
0005	2.54	2.05	0.39	2016	2.55	2.05	0.39	2710	11.52	8.45	0.31
0008	2.13	1.72	0.39	2021	2.57	2.02	0.35	2714	4.11	3.31	0.39
0016	4.03	2.95	0.31	2039	2.48	2.00	0.39	2731	3.01	2.43	0.39
0034	2.49	1.96	0.35	2041	2.36	1.89	0.39	2735	3.54	2.86	0.39
0035	1.79	1.41	0.35	2065	1.60	1.26	0.35	2747	–	2.18	0.40
0036	4.73	3.82	0.39	2070	3.53	2.76	0.35	2759	5.23	4.22	0.39
0037	2.85	2.08	0.31	2081	4.50	3.77	0.40	2790	1.85	1.56	0.40
0042	5.33	3.84	0.35	2089	2.77	2.23	0.39	2791	–	3.10	0.39
0050	4.33	2.90	0.31	2095	3.18	2.50	0.35	2797	4.50	3.78	0.40
0059D	0.11	0.04	0.27	2105	3.88	3.25	0.40	2799	4.37	3.15	0.35
0065D	0.04	0.01	0.31	2110	1.70	1.37	0.39	2802	4.57	3.60	0.35
0066D	0.04	0.02	0.35	2111	1.81	1.46	0.39	2835	2.15	1.80	0.40
0067D	0.04	0.02	0.35	2112	3.35	2.70	0.39	2836	2.42	2.02	0.40
0079	2.97	2.34	0.35	2114	2.51	2.10	0.40	2841	3.83	3.10	0.39
0083	3.86	3.04	0.35	2121	1.15	0.96	0.40	2881	2.60	2.18	0.40
0106	5.92	4.10	0.27	2130	1.60	1.26	0.35	2883	2.46	1.98	0.39
0113	3.89	3.15	0.39	2131	2.15	1.74	0.39	2913	–	1.98	0.39
0170	1.95	1.57	0.39	2143	2.17	1.82	0.40	2915	2.95	2.15	0.31
0251	3.11	2.44	0.35	2157	4.31	3.45	0.39	2916	3.04	2.22	0.31
0400	–	1.90	0.35	2172	1.37	1.00	0.31	2923	1.52	1.28	0.40
0401	8.89	6.19	0.27	2174	2.70	2.17	0.39	2942	–	0.92	0.40
0771N	0.43	–	–	2211	7.79	5.68	0.31	2960	4.27	3.35	0.35
0908P	111.00	87.44	0.35	2220	2.03	1.59	0.35	3004	1.39	0.96	0.27
0913P	417.00	327.30	0.35	2286	–	1.59	0.35	3018	3.02	2.09	0.27
0917	3.24	2.72	0.40	2288	3.65	2.94	0.39	3022	2.85	2.29	0.39
1005*	5.29	2.98	0.24	2300	–	1.78	0.39	3027	2.03	1.48	0.31
1016*	15.75	8.87	0.24	2302	1.69	1.33	0.35	3028	3.40	2.48	0.31
1164D	3.71	2.43	0.24	2305	2.04	1.49	0.31	3030	4.28	3.13	0.31
1165D	2.47	1.62	0.24	2361	1.60	1.26	0.35	3040	4.23	3.33	0.35
1320	1.32	0.91	0.27	2362	1.98	1.59	0.39	3041	3.34	2.62	0.35
1322	6.30	3.80	0.24	2380	1.86	1.50	0.39	3042	4.28	3.36	0.35
1430	4.95	3.62	0.31	2386	–	1.78	0.39	3064	3.35	2.64	0.35
1438	11.16	8.12	0.31	2388	1.37	1.15	0.40	3076	2.71	2.18	0.39
1452	2.72	1.98	0.31	2402	2.34	1.71	0.31	3081D	3.84	3.00	0.35
1463	7.81	5.16	0.24	2413	2.32	1.83	0.35	3082D	4.26	3.10	0.31
1472	2.80	2.05	0.31	2416	1.98	1.60	0.39	3085D	4.34	3.39	0.35
1624D	2.45	1.69	0.27	2417	1.40	1.13	0.39	3110	3.69	2.90	0.35
1642	2.61	1.91	0.31	2501	2.21	1.78	0.39	3111	1.75	1.41	0.39
1654	3.10	2.25	0.31	2503	1.12	0.90	0.39	3113	1.59	1.25	0.35
1655	–	1.91	0.31	2534	–	1.78	0.39	3114	3.09	2.40	0.34
1699	2.21	1.61	0.31	2570	3.64	2.93	0.39	3118	1.78	1.49	0.40
1701	2.72	1.89	0.27	2585	2.77	2.17	0.35	3119	1.30	1.11	0.44
1710D	3.28	2.37	0.31	2586	2.68	2.17	0.39	3122	1.89	1.59	0.40
1741	–	1.89	0.27	2587	1.96	1.57	0.39	3126	1.30	1.02	0.35
1747	2.05	1.50	0.31	2589	1.89	1.49	0.35	3131	1.61	1.27	0.35
1748	5.27	3.87	0.31	2600	4.02	3.22	0.39	3132	4.33	3.51	0.39
1803D	6.98	5.00	0.31	2623	5.05	3.69	0.31	3145	1.99	1.57	0.35
1852	–	1.24	0.24	2651	1.86	1.51	0.39	3146	1.95	1.54	0.35
1853	–	1.89	0.27	2660	2.53	2.13	0.40	3169	2.17	1.75	0.39
1860	–	1.70	0.31	2670	–	1.74	0.39	3175	–	1.75	0.39
1924	2.72	2.19	0.39	2683	–	1.78	0.39	3179	1.84	1.48	0.39
1925	3.06	2.41	0.35	2688	2.15	1.74	0.39	3180	2.58	2.09	0.39
2002	3.02	2.43	0.39	2701	9.34	6.44	0.27	3188	2.00	1.58	0.35
2003	3.28	2.57	0.35	2702	14.82	9.79	0.24	3220	2.00	1.57	0.35
2014	4.28	3.13	0.31	2709	14.35	9.98	0.27	3223	–	2.09	0.39

Refer to the Classification codes section of the ***Basic Manual*** for any state specific classification phraseology.

* Refer to the Footnotes Page for additional information on this class code.

Effective January 1, 2022

CLASS CODE	LOSS COST	ELR	D RATIO	CLASS CODE	LOSS COST	ELR	D RATIO	CLASS CODE	LOSS COST	ELR	D RATIO
3224	3.15	2.63	0.40	4021	4.62	3.63	0.35	4635	2.39	1.65	0.27
3227	2.75	2.21	0.39	4034	5.87	4.29	0.31	4653	1.45	1.16	0.39
3240	–	1.75	0.39	4036	2.22	1.62	0.31	4665	6.89	5.05	0.31
3241	2.32	1.87	0.39	4038	3.29	2.73	0.40	4670	–	2.59	0.35
3255	2.29	1.92	0.40	4053	–	1.88	0.35	4683	3.31	2.59	0.35
3257	2.17	1.75	0.39	4061	–	1.88	0.35	4686	1.89	1.38	0.31
3270	3.23	2.60	0.39	4062	2.39	1.88	0.35	4692	0.78	0.63	0.39
3300	4.46	3.75	0.40	4101	1.95	1.53	0.35	4693	0.92	0.74	0.39
3303	1.85	1.49	0.39	4109	0.52	0.42	0.39	4703	1.76	1.38	0.35
3307	2.48	1.95	0.35	4110	1.02	0.82	0.39	4716	–	2.59	0.35
3315	2.52	2.02	0.39	4111	1.66	1.34	0.39	4717	1.92	1.60	0.40
3334	1.64	1.28	0.35	4113	–	1.34	0.39	4720	1.99	1.57	0.35
3336	2.34	1.84	0.35	4114	2.73	2.14	0.35	4740	0.96	0.63	0.24
3365	3.19	2.02	0.27	4130	2.78	2.25	0.39	4741	2.17	1.70	0.35
3372	2.66	2.09	0.35	4131	4.13	3.33	0.39	4751	2.12	1.55	0.31
3373	4.35	3.50	0.39	4133	1.93	1.62	0.40	4771N	2.46	1.70	0.27
3383	1.37	1.11	0.39	4149	0.71	0.59	0.40	4777	3.26	2.26	0.27
3385	0.86	0.69	0.39	4206	2.49	2.01	0.39	4825	0.67	0.49	0.31
3400	3.98	3.21	0.39	4207	1.97	1.36	0.27	4828	1.79	1.24	0.27
3507	2.34	1.84	0.35	4239	1.85	1.28	0.27	4829	0.97	0.67	0.27
3515	2.33	1.84	0.35	4240	2.90	2.44	0.40	4902	2.15	1.74	0.39
3548	1.40	1.13	0.39	4243	1.95	1.53	0.35	4923	0.93	0.73	0.35
3559	2.12	1.66	0.35	4244	2.39	1.75	0.31	4940	–	2.18	0.39
3574	2.18	1.74	0.39	4250	1.69	1.33	0.35	5020	3.54	2.25	0.27
3581	1.13	0.91	0.39	4251	3.41	2.75	0.39	5022	5.65	3.41	0.24
3612	1.84	1.44	0.35	4263	3.26	2.56	0.35	5037	8.07	4.87	0.24
3620	3.28	2.40	0.31	4273	2.12	1.66	0.35	5040	8.20	4.97	0.24
3629	1.39	1.09	0.35	4279	2.33	1.70	0.31	5057	4.27	2.57	0.24
3632	2.57	2.02	0.35	4282	–	1.70	0.31	5059	18.39	11.16	0.24
3634	1.40	1.10	0.35	4283	1.20	0.96	0.39	5067	–	4.97	0.24
3635	1.79	1.41	0.35	4299	1.90	1.50	0.35	5069	–	11.16	0.24
3638	2.15	1.74	0.39	4304	4.40	3.46	0.35	5102	4.68	2.97	0.27
3642	1.11	0.89	0.39	4307	1.74	1.46	0.40	5146	3.97	2.65	0.31
3643	2.75	2.01	0.31	4351	0.92	0.74	0.39	5160	1.64	0.99	0.24
3647	2.62	2.06	0.35	4352	1.49	1.20	0.39	5183	2.46	1.56	0.27
3648	1.39	1.16	0.40	4360	–	0.28	0.31	5188	2.32	1.47	0.27
3681	0.62	0.50	0.39	4361	0.61	0.50	0.39	5190	2.21	1.40	0.27
3685	0.96	0.77	0.39	4410	2.85	2.30	0.39	5191	0.70	0.51	0.31
3719	0.76	0.46	0.24	4420	3.50	2.42	0.27	5192	2.48	1.95	0.35
3724	3.13	1.90	0.24	4431	1.17	0.98	0.40	5213	4.65	2.81	0.24
3726	3.17	1.91	0.24	4432	1.10	0.92	0.40	5215	4.47	2.99	0.31
3803	2.18	1.75	0.39	4439	–	1.22	0.35	5221	3.79	2.40	0.27
3807	2.05	1.65	0.39	4452	2.27	1.78	0.35	5222	6.23	3.77	0.24
3808	3.39	2.66	0.35	4459	2.14	1.56	0.31	5223	4.08	2.73	0.31
3821	4.16	3.04	0.31	4470	2.04	1.60	0.35	5348	3.12	2.08	0.31
3822	3.24	2.62	0.39	4484	2.41	1.94	0.39	5402	4.45	3.28	0.39
3824	3.11	2.51	0.39	4493	2.87	2.27	0.35	5403	4.49	2.85	0.27
3826	0.91	0.71	0.35	4511	0.36	0.28	0.35	5437	4.01	2.55	0.27
3827	2.10	1.70	0.39	4557	2.22	1.62	0.31	5443	2.52	1.81	0.35
3830	0.67	0.52	0.35	4558	1.55	1.22	0.35	5445	3.43	2.08	0.24
3851	2.04	1.63	0.39	4568	2.84	2.07	0.31	5462	3.88	2.59	0.31
3865	2.71	2.28	0.40	4581	1.56	1.09	0.27	5472	4.75	2.87	0.24
3881	3.24	2.54	0.35	4583	4.22	2.93	0.27	5473	6.35	3.85	0.24
4000	3.50	2.42	0.27	4597	–	1.62	0.31	5474	4.51	2.74	0.24
4018D	5.11	3.67	0.31	4611	1.02	0.82	0.39	5478	3.80	2.41	0.27

Refer to the Classification codes section of the ***Basic Manual*** for any state specific classification phraseology.

* Refer to the Footnotes Page for additional information on this class code.

Effective January 1, 2022

CLASS CODE	LOSS COST	ELR	D RATIO	CLASS CODE	LOSS COST	ELR	D RATIO	CLASS CODE	LOSS COST	ELR	D RATIO
5479	5.81	3.89	0.31	7024M	2.72	1.78	0.24	7600	3.07	2.24	0.31
5480	4.58	2.90	0.27	7038M	4.34	2.89	0.24	7605	1.54	0.97	0.27
5491	1.46	0.93	0.27	7046M	8.75	5.74	0.24	7610	0.39	0.28	0.31
5505	–	2.73	0.27	7047M	4.46	2.79	0.24	7705	3.29	2.57	0.35
5506	4.29	2.73	0.27	7050M	7.90	5.04	0.24	7710	4.03	2.79	0.27
5507	3.14	1.99	0.27	7090M	4.82	3.21	0.24	7711	4.03	2.79	0.27
5508	–	1.99	0.27	7098M	9.72	6.38	0.24	7720	2.50	1.82	0.31
5515	–	1.81	0.35	7099M	15.92	10.02	0.24	7855	2.84	1.90	0.31
5535	4.99	3.03	0.24	7133	2.56	1.77	0.27	8001	1.74	1.41	0.39
5537	3.19	2.13	0.31	7151M	3.11	2.15	0.27	8002	1.71	1.38	0.39
5551	11.90	7.23	0.24	7152M	5.66	3.75	0.27	8006	1.53	1.29	0.40
5606	1.06	0.64	0.24	7153M	3.46	2.40	0.27	8008	0.85	0.71	0.40
5610	3.63	2.43	0.31	7219	5.70	3.93	0.27	8010	1.60	1.29	0.39
5645	8.40	5.10	0.24	7222	5.68	3.90	0.27	8013	0.32	0.25	0.35
5703	12.83	8.62	0.31	7225	7.68	5.57	0.31	8015	0.59	0.46	0.35
5705	17.45	11.76	0.31	7228	–	3.93	0.27	8017	1.15	0.97	0.40
5951	0.40	0.33	0.39	7229	–	3.93	0.27	8018	2.25	1.81	0.39
6003	4.55	2.88	0.27	7230	6.00	4.71	0.35	8021	2.28	1.84	0.39
6005	3.91	2.62	0.31	7231	6.50	5.08	0.35	8031	1.89	1.53	0.39
6045	3.44	2.30	0.31	7232	6.87	4.72	0.27	8032	1.66	1.34	0.39
6204	6.07	3.86	0.27	7250	–	3.93	0.27	8033	1.41	1.19	0.41
6206	2.05	1.24	0.24	7309F	7.36	3.50	0.22	8034	1.85	1.54	0.40
6213	1.23	0.74	0.24	7313F	2.60	1.23	0.22	8037	1.58	1.36	0.44
6214	1.36	0.86	0.27	7317F	6.40	3.04	0.22	8039	1.20	1.01	0.41
6216	3.77	2.27	0.24	7327F	14.97	7.11	0.22	8044	1.88	1.51	0.39
6217	2.73	1.65	0.24	7333M	2.03	1.33	0.24	8045	0.47	0.38	0.39
6229	4.13	2.76	0.31	7335M	2.26	1.48	0.24	8046	2.04	1.65	0.39
6233	2.03	1.22	0.24	7337M	3.70	2.32	0.24	8047	0.68	0.55	0.39
6235	4.74	2.86	0.24	7350F	7.57	3.75	0.26	8058	2.33	1.88	0.39
6236	4.57	3.04	0.31	7360	3.34	2.43	0.31	8061	1.45	1.17	0.39
6237	1.06	0.67	0.27	7370	3.62	2.92	0.39	8072	0.43	0.37	0.41
6251D	2.73	1.72	0.27	7380	4.64	3.38	0.31	8102	1.75	1.41	0.39
6252D	2.91	1.74	0.24	7382	4.08	3.21	0.35	8103	2.41	1.90	0.35
6260	–	1.72	0.27	7390	4.21	3.38	0.39	8105	–	1.81	0.39
6306	4.20	2.66	0.27	7394M	3.56	2.33	0.24	8106	4.32	3.16	0.31
6319	3.10	1.88	0.24	7395M	3.95	2.59	0.24	8107	2.14	1.48	0.27
6325	2.65	1.61	0.24	7398M	6.47	4.07	0.24	8111	1.50	1.18	0.35
6400	4.65	3.11	0.31	7402	0.09	0.07	0.39	8116	2.00	1.57	0.35
6503	1.92	1.54	0.39	7403	3.56	2.86	0.39	8203	5.57	4.36	0.35
6504	2.04	1.65	0.39	7405N	1.08	0.87	0.39	8204	3.01	2.36	0.35
6702M*	3.17	2.31	0.31	7420	5.41	3.52	0.24	8209	3.24	2.62	0.39
6703M*	5.77	4.03	0.31	7421	0.56	0.41	0.31	8215	3.28	2.41	0.31
6704M*	3.52	2.56	0.31	7422	1.23	0.85	0.27	8227	2.81	1.79	0.27
6824F	5.33	2.74	0.30	7425	1.49	1.02	0.27	8232	4.72	3.44	0.31
6825F	2.07	0.98	0.22	7431N	0.89	0.61	0.27	8233	1.76	1.27	0.31
6826F	3.15	1.62	0.30	7445N	0.58	–	–	8235	3.22	2.52	0.35
6834	2.18	1.76	0.39	7453N	0.48	–	–	8263	4.53	3.57	0.35
6835	2.41	1.58	0.24	7502	1.50	1.09	0.31	8264	3.99	2.92	0.31
6836	2.80	2.20	0.35	7515	0.86	0.56	0.24	8265	3.73	2.58	0.27
6845a	a	a	a	7520	2.42	1.90	0.35	8279	4.92	3.43	0.27
6872F	7.30	3.47	0.22	7538	4.08	2.47	0.24	8288	6.16	4.88	0.35
6874F	11.71	5.56	0.22	7539	1.53	1.06	0.27	8291	2.80	2.21	0.35
6882	2.81	1.94	0.27	7540	2.31	1.53	0.24	8292	3.23	2.60	0.39
6884	4.51	3.09	0.27	7580	2.17	1.59	0.31	8293	6.01	4.83	0.39
7016M	2.45	1.61	0.24	7590	2.47	1.81	0.31	8304	4.16	2.89	0.27

Refer to the Classification codes section of the ***Basic Manual*** for any state specific classification phraseology.

* Refer to the Footnotes Page for additional information on this class code.

Effective January 1, 2022

CLASS CODE	LOSS COST	ELR	D RATIO	CLASS CODE	LOSS COST	ELR	D RATIO	CLASS CODE	LOSS COST	ELR	D RATIO
8350	4.65	3.21	0.27	9016	2.53	2.06	0.39				
8353	3.24	2.36	0.31	9019	1.83	1.34	0.31				
8370	3.46	2.52	0.31	9033	1.59	1.25	0.35				
8381	1.88	1.48	0.35	9040	3.07	2.58	0.41				
8385	1.82	1.43	0.35	9044	0.83	0.69	0.40				
8387	2.16	1.70	0.35	9052	1.51	1.27	0.40				
8391	1.87	1.47	0.35	9058	1.32	1.13	0.44				
8392	1.82	1.52	0.40	9060	1.10	0.92	0.40				
8393	1.30	0.95	0.31	9061	1.09	0.91	0.40				
8500	4.30	3.14	0.31	9062	1.08	0.90	0.40				
8601	0.22	0.15	0.27	9063	0.68	0.58	0.41				
8602	1.00	0.73	0.31	9077F	2.91	1.61	0.38				
8603	0.06	0.05	0.39	9082	1.03	0.89	0.44				
8606	1.46	1.01	0.27	9083	0.92	0.80	0.44				
8709F	3.30	1.57	0.22	9084	1.08	0.91	0.40				
8719	1.60	1.11	0.27	9088a	a	a	a				
8720	0.97	0.67	0.27	9089	0.82	0.68	0.40				
8721	0.25	0.18	0.31	9093	1.02	0.86	0.41				
8723	0.11	0.09	0.35	9101	2.93	2.47	0.40				
8725	1.70	1.23	0.31	9102	2.26	1.78	0.35				
8726F	1.46	0.75	0.30	9110	2.37	1.92	0.39				
8728	0.42	0.31	0.31	9154	1.42	1.15	0.39				
8734M	0.32	0.23	0.31	9156	2.00	1.68	0.40				
8737M	0.29	0.21	0.31	9170	10.05	7.01	0.27				
8738M	0.53	0.36	0.31	9178	9.48	8.25	0.44				
8742	0.24	0.17	0.31	9179	16.04	13.88	0.44				
8745	2.90	2.28	0.35	9180	3.69	2.91	0.35				
8748	0.48	0.33	0.27	9182	1.72	1.40	0.39				
8755	0.28	0.21	0.31	9186	10.84	7.57	0.27				
8799	0.36	0.29	0.39	9220	3.33	2.61	0.35				
8800	1.08	0.87	0.39	9402	3.98	2.76	0.27				
8803	0.05	0.03	0.31	9403	6.13	4.24	0.27				
8805M	0.15	0.12	0.39	9410	2.60	2.10	0.39				
8810	0.11	0.09	0.39	9501	2.78	2.03	0.31				
8814M	0.13	0.10	0.39	9505	3.24	2.54	0.35				
8815M	0.24	0.19	0.39	9516	2.07	1.62	0.35				
8820	0.10	0.07	0.31	9519	2.99	2.18	0.31				
8824	1.67	1.44	0.44	9521	3.12	2.28	0.31				
8825	–	1.48	0.41	9522	4.74	3.94	0.40				
8826	1.76	1.48	0.41	9534	3.74	2.25	0.24				
8829	–	1.44	0.44	9554	6.64	4.22	0.27				
8831	0.99	0.86	0.44	9586	0.43	0.36	0.40				
8832	0.20	0.17	0.39	9600	2.87	2.31	0.39				
8833	0.96	0.77	0.39	9620	1.10	0.80	0.31				
8835	1.67	1.35	0.39								
8855	0.13	0.10	0.39								
8856	0.40	0.32	0.39								
8861	1.09	0.88	0.39								
8868	0.36	0.31	0.40								
8869	0.83	0.70	0.41								
8871	0.06	0.05	0.39								
8901	0.15	0.11	0.31								
9012	0.65	0.47	0.31								
9014	2.11	1.70	0.39								
9015	2.62	2.06	0.35								

Refer to the Classification codes section of the ***Basic Manual*** for any state specific classification phraseology.

* Refer to the Footnotes Page for additional information on this class code.

FOOTNOTES

a Advisory loss cost for each individual risk must be obtained from NCCI Customer Service or the Rating Organization having jurisdiction.

D Advisory loss cost for classification already includes the specific disease loading shown in the table below. See the ***Basic Manual*** rule, Supplemental and supplementary loading.

Code No.	Disease Loading	Symbol	Code No.	Disease Loading	Symbol	Code No.	Disease Loading	Symbol
0059D	0.11	S	1165D	0.01	S	3082D	0.03	S
0065D	0.04	S	1624D	0.01	S	3085D	0.03	S,L
0066D	0.04	S	1710D	0.02	S	4018D	0.06	S
0067D	0.04	S	1803D	0.15	S	6251D	0.01	S
1164D	0.03	S	3081D	0.02	S	6252D	0.01	S

S=Silica, L=Lead

F Advisory loss cost provides for coverage under the United States Longshore and Harbor Workers Compensation Act and its extensions. Loss cost contains a provision for the USL&HW Assessment.

M Risks are subject to Admiralty Law or Federal Employers Liability Act (FELA). However, the published loss cost is for risks that voluntarily purchase standard workers compensation and employers liability coverage. A provision for the USL&HW Assessment is included for those classifications under Program II USL Act.

N This code is part of a ratable / non-ratable group shown below. The statistical non-ratable code and corresponding advisory loss cost are applied in addition to the basic classification when determining premium.

Class Code	Non-Ratable Element Code
4771	0771
7405	7445
7431	7453

P Classification is computed on a per capita basis.

*** Class Codes with Specific Footnotes**

1005 Advisory loss cost includes a non-ratable disease element of $0.74. (For coverage written separately for federal benefits only, $0.72. For coverage written separately for state benefits only, $0.02.)

1016 Advisory loss cost includes a non-ratable disease element of $2.22. (For coverage written separately for federal benefits only, $2.15. For coverage written separately for state benefits only, $0.07.)

6702 Loss cost and rating values only appropriate for laying or relaying of tracks or maintenance of way - no work on elevated railroads. Otherwise, assign appropriate construction or erection code loss cost and elr each x 1.215.

6703 Loss cost and rating values only appropriate for laying or relaying of tracks or maintenance of way - no work on elevated railroads. Otherwise, assign appropriate construction or erection class loss cost x 2.211 and elr x 2.12.

6704 Loss cost and rating values only appropriate for laying or relaying of tracks or maintenance of way - no work on elevated railroads. Otherwise, assign appropriate construction or erection class loss cost and elr each x 1.35.

Effective January 1, 2022

ADVISORY MISCELLANEOUS VALUES

Advisory Loss Elimination Ratios - The following percentages are applicable by deductible amount and hazard group for total losses on a per occurrence basis. They do not include a safety factor.

Total Losses							
Deductible	HAZARD GROUP						
Amount	A	B	C	D	E	F	G
$100	1.1%	0.9%	0.6%	0.5%	0.4%	0.2%	0.2%
$200	2.2%	1.7%	1.2%	0.9%	0.7%	0.5%	0.4%
$300	3.2%	2.5%	1.8%	1.4%	1.0%	0.7%	0.5%
$400	4.1%	3.2%	2.3%	1.8%	1.3%	0.9%	0.7%
$500	5.0%	3.9%	2.8%	2.2%	1.6%	1.1%	0.9%
$1,000	8.6%	6.7%	5.0%	3.9%	2.9%	2.1%	1.6%
$1,500	11.5%	9.0%	6.7%	5.4%	4.1%	2.9%	2.3%
$2,000	13.8%	10.9%	8.2%	6.6%	5.1%	3.7%	2.9%
$2,500	15.8%	12.5%	9.6%	7.8%	6.0%	4.4%	3.5%
$5,000	23.2%	18.7%	14.9%	12.3%	9.7%	7.5%	6.1%
$10,000	32.5%	27.1%	22.3%	19.1%	15.4%	12.4%	10.3%
$15,000	39.0%	33.3%	28.0%	24.4%	20.0%	16.4%	13.9%
$20,000	44.2%	38.3%	32.7%	28.9%	23.9%	20.0%	17.0%

Basis of premium applicable in accordance with the ***Basic Manual*** notes for Code 7370 --"Taxicab Co.":

Employee operated vehicle..... $80,400
Leased or rented vehicle..... $53,600

Maximum Weekly Payroll applicable in accordance with the ***Basic Manual*** notes for Code 9178 -- "Athletic Sports or Park: Noncontact Sports," and Code 9179 -- "Athletic Sports or Park: Contact Sports" $1,000

Premium Determination for Executive Officers, Members of Limited Liability Companies, Partners and Sole Proprietors in accordance with the ***Basic Manual*** rules, Rule for premium determination of executive officers, Rule for premium determination of members of LLCs, and Rule for premium determination for partners or sole proprietors (Annual Payroll) $48,200

Terrorism - (Advisory Loss Cost) 0.005

United States Longshore and Harbor Workers' Compensation Coverage Percentage applicable only in connection with the ***Basic Manual*** rule, Federal coverages..... 84%

(Multiply a Non-F classification loss cost by a factor of 1.84 to adjust for differences in benefits and loss-based expenses. This factor is the product of the adjustment for differences in benefits (1.75) and the adjustment for differences in loss-based expenses (1.052).)

Experience Rating Eligibility

A risk qualifies for experience rating on an intrastate basis when it meets the premium eligibility requirements for the state in which it operates. The eligibility amount varies by rating effective date. The ***Experience Rating Plan Manual*** should be referenced for the latest approved eligibility amounts by state and by effective date.

MISSOURI

Advisory Loss Costs and Rating Values Filing – January 1, 2022

Proposed Voluntary Loss Costs and Rating Values

Summary Description of Expected Loss Rates and D-ratios

An expected loss rate for a classification is used to estimate the expected losses per $100 of payroll during the experience rating period for risks within that classification. These expected losses are then compared with the actual losses of a risk during the experience rating period to determine the experience modification (mod). The actual losses reflect the loss data during the experience rating period. Expected losses and actual losses must be at the same level to enable an appropriate comparison for purposes of the experience mod calculation. As such, the proposed loss costs are adjusted to reflect the average loss levels of the proposed effective rating period. This is accomplished through the application of ELR factors to the proposed underlying pure premiums. These ELR factors, calculated by hazard group (HG), remove the effects of items such as loss development, losses in excess of the state accident limit, a portion of medical-only losses, benefit changes, trend, and loss-based expenses.

An adjustment is made to the ELR factors so that the resulting ELRs produce an expected experience rating off-balance that equals the targeted experience rating off-balance used in the calculation of the overall loss cost level change for the state. For the calculation of experience mods, the experience rating plan for Missouri uses actual losses net of the deductible reimbursement amount reported per the ***Unit Statistical Reporting Guidebook*** for the calculation of experience mods. As a result, the ELR adjustment mentioned above also modifies the ELRs uniformly across all class codes in the state to account for net experience rating. The final ELR for each classification is calculated as follows:

ELR = {(HG indemnity ELR factor) x (indemnity pure premium) +
(HG medical ELR factor) x (medical pure premium)} x Manual/Standard Ratio

In experience rating, losses are divided into primary and excess portions. For each claim, losses below the split point are primary losses, while losses above the split point are excess losses. The d-ratio represents the estimated ratio of expected primary losses to expected total losses for a classification. The d-ratio is used to determine the expected primary losses to be used in the experience mod calculation.

D-ratio factors are calculated separately for indemnity and medical losses by hazard group and are based on the latest three years of Unit Statistical Data. A comparison of the resulting d-ratio factors across hazard groups is done to ensure that the factors monotonically decrease from hazard group A to hazard group G. If they do not, an adjustment is made by averaging the d-ratios over adjacent hazard groups. The final D-ratio for each classification is calculated as follows:

D-ratio = {(HG indemnity d-ratio factor) x (indemnity pure premium) +
(HG medical d-ratio factor) x (medical pure premium)} / total pure premium

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Advisory Loss Costs and Rating Values Filing – January 1, 2022

Proposed Values for Inclusion in the Experience Rating Plan Manual

The following pages include a summary description of the weighting and ballast values along with proposed values for inclusion in the Experience Rating Plan Manual, such as:

- Table of Weighting Values
- Table of Ballast Values
- Experience rating premium eligibility amounts

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Advisory Loss Costs and Rating Values Filing – January 1, 2022

Proposed Values for Inclusion in the Experience Rating Plan Manual

Summary Description of the Weighting and Ballast Values

Table of Weighting Values

The weighting value determines the volume of actual and expected excess losses that will enter the experience modification formula. The weighting value increases as expected losses increase with larger insureds receiving a larger weighting value. The weighting value for various levels of expected losses is provided in the Table of Weighting Values. The table is updated in each experience filing based on the state reference point.

The state reference point is calculated based on Unit Statistical Data as the state average cost per case for the experience rating period multiplied by 250. The state reference point serves to determine how much credibility is assigned to the losses of an individual risk and as an index of claim cost differences by state. The state per claim accident limitation shown on the Table of Weighting Values is 10% of the state reference point.

Table of Ballast Values

The ballast value is a stabilizing value designed to limit the effect of any actual loss experience on the experience rating modification. It is added to both the numerator and denominator in the experience modification calculation and increases as expected losses increase. The ballast value for various levels of expected loss ranges is provided in the Table of Ballast Values. The table is updated based on the state reference point. The G value used in the ballast formula is the state reference point divided by 250,000, rounded to the nearest 0.05.

Effective January 1, 2022

TABLE OF WEIGHTING VALUES
APPLICABLE TO ALL POLICIES
Experience Rating Program - ERA

Expected Losses			Weighting Values	Expected Losses			Weighting Values
0	--	3,026	0.04	1,706,386	--	1,800,509	0.44
3,027	--	12,232	0.05	1,800,510	--	1,900,082	0.45
12,233	--	21,636	0.06	1,900,083	--	2,005,593	0.46
21,637	--	31,243	0.07	2,005,594	--	2,117,591	0.47
31,244	--	41,060	0.08	2,117,592	--	2,236,693	0.48
41,061	--	68,676	0.09	2,236,694	--	2,363,599	0.49
68,677	--	102,227	0.10	2,363,600	--	2,499,102	0.50
102,228	--	132,070	0.11	2,499,103	--	2,644,109	0.51
132,071	--	161,128	0.12	2,644,110	--	2,799,657	0.52
161,129	--	190,190	0.13	2,799,658	--	2,966,938	0.53
190,191	--	219,609	0.14	2,966,939	--	3,147,335	0.54
219,610	--	249,586	0.15	3,147,336	--	3,342,452	0.55
249,587	--	280,255	0.16	3,342,453	--	3,554,170	0.56
280,256	--	311,718	0.17	3,554,171	--	3,784,702	0.57
311,719	--	344,061	0.18	3,784,703	--	4,036,674	0.58
344,062	--	377,359	0.19	4,036,675	--	4,313,224	0.59
377,360	--	411,685	0.20	4,313,225	--	4,618,134	0.60
411,686	--	447,109	0.21	4,618,135	--	4,956,001	0.61
447,110	--	483,703	0.22	4,956,002	--	5,332,477	0.62
483,704	--	521,539	0.23	5,332,478	--	5,754,582	0.63
521,540	--	560,693	0.24	5,754,583	--	6,231,147	0.64
560,694	--	601,245	0.25	6,231,148	--	6,773,440	0.65
601,246	--	643,278	0.26	6,773,441	--	7,396,067	0.66
643,279	--	686,883	0.27	7,396,068	--	8,118,310	0.67
686,884	--	732,154	0.28	8,118,311	--	8,966,154	0.68
732,155	--	779,194	0.29	8,966,155	--	9,975,487	0.69
779,195	--	828,113	0.30	9,975,488	--	11,197,305	0.70
828,114	--	879,030	0.31	11,197,306	--	12,706,603	0.71
879,031	--	932,074	0.32	12,706,604	--	14,618,374	0.72
932,075	--	987,383	0.33	14,618,375	--	17,118,374	0.73
987,384	--	1,045,108	0.34	17,118,375	--	20,527,457	0.74
1,045,109	--	1,105,414	0.35	20,527,458	--	25,451,677	0.75
1,105,415	--	1,168,481	0.36	25,451,678	--	33,189,724	0.76
1,168,482	--	1,234,503	0.37	33,189,725	--	47,118,193	0.77
1,234,504	--	1,303,697	0.38	47,118,194	--	79,617,926	0.78
1,303,698	--	1,376,297	0.39	79,617,927	--	242,116,514	0.79
1,376,298	--	1,452,564	0.40	242,116,515		AND OVER	0.80
1,452,565	--	1,532,784	0.41				
1,532,785	--	1,617,274	0.42				
1,617,275	--	1,706,385	0.43				

(a) G	14.45
(b) State Per Claim Accident Limitation	$361,000
(c) State Multiple Claim Accident Limitation	$722,000
(d) USL&HW Per Claim Accident Limitation	$625,500
(e) USL&HW Multiple Claim Accident Limitation	$1,251,000
(f) Employers Liability Accident Limitation	$55,000
(g) Primary/Excess Loss Split Point	$18,500
(h) USL&HW Act -- Expected Loss Factor -- Non-F Classes	1.75

(Multiply a Non-F classification ELR by the USL&HW Act - Expected Loss Factor of 1.75.)

Effective January 1, 2022

TABLE OF BALLAST VALUES
APPLICABLE TO ALL POLICIES

Experience Rating Plan - ERA

Expected Losses			Ballast Values	Expected Losses			Ballast Values	Expected Losses			Ballast Values
0	--	77,724	36,125	2,494,085	--	2,566,293	289,000	5,022,102	--	5,094,340	541,875
77,725	--	133,770	43,350	2,566,294	--	2,638,504	296,225	5,094,341	--	5,166,580	549,100
133,771	--	198,168	50,575	2,638,505	--	2,710,717	303,450	5,166,581	--	5,238,821	556,325
198,169	--	266,103	57,800	2,710,718	--	2,782,933	310,675	5,238,822	--	5,311,061	563,550
266,104	--	335,691	65,025	2,782,934	--	2,855,150	317,900	5,311,062	--	5,383,302	570,775
335,692	--	406,153	72,250	2,855,151	--	2,927,368	325,125	5,383,303	--	5,455,543	578,000
406,154	--	477,124	79,475	2,927,369	--	2,999,589	332,350	5,455,544	--	5,527,784	585,225
477,125	--	548,417	86,700	2,999,590	--	3,071,810	339,575	5,527,785	--	5,600,026	592,450
548,418	--	619,924	93,925	3,071,811	--	3,144,033	346,800	5,600,027	--	5,672,268	599,675
619,925	--	691,582	101,150	3,144,034	--	3,216,257	354,025	5,672,269	--	5,744,509	606,900
691,583	--	763,349	108,375	3,216,258	--	3,288,482	361,250	5,744,510	--	5,816,752	614,125
763,350	--	835,197	115,600	3,288,483	--	3,360,709	368,475	5,816,753	--	5,888,994	621,350
835,198	--	907,108	122,825	3,360,710	--	3,432,936	375,700	5,888,995	--	5,961,236	628,575
907,109	--	979,068	130,050	3,432,937	--	3,505,164	382,925	5,961,237	--	6,033,479	635,800
979,069	--	1,051,068	137,275	3,505,165	--	3,577,393	390,150	6,033,480	--	6,105,722	643,025
1,051,069	--	1,123,099	144,500	3,577,394	--	3,649,623	397,375	6,105,723	--	6,177,965	650,250
1,123,100	--	1,195,156	151,725	3,649,624	--	3,721,854	404,600	6,177,966	--	6,250,208	657,475
1,195,157	--	1,267,235	158,950	3,721,855	--	3,794,085	411,825	6,250,209	--	6,322,452	664,700
1,267,236	--	1,339,332	166,175	3,794,086	--	3,866,317	419,050	6,322,453	--	6,394,695	671,925
1,339,333	--	1,411,445	173,400	3,866,318	--	3,938,550	426,275	6,394,696	--	6,466,939	679,150
1,411,446	--	1,483,571	180,625	3,938,551	--	4,010,783	433,500	6,466,940	--	6,539,182	686,375
1,483,572	--	1,555,708	187,850	4,010,784	--	4,083,017	440,725	6,539,183	--	6,611,426	693,600
1,555,709	--	1,627,855	195,075	4,083,018	--	4,155,252	447,950	6,611,427	--	6,683,670	700,825
1,627,856	--	1,700,011	202,300	4,155,253	--	4,227,487	455,175	6,683,671	--	6,755,915	708,050
1,700,012	--	1,772,175	209,525	4,227,488	--	4,299,722	462,400	6,755,916	--	6,828,159	715,275
1,772,176	--	1,844,345	216,750	4,299,723	--	4,371,958	469,625	6,828,160	--	6,899,875	722,500
1,844,346	--	1,916,521	223,975	4,371,959	--	4,444,195	476,850				
1,916,522	--	1,988,703	231,200	4,444,196	--	4,516,432	484,075				
1,988,704	--	2,060,889	238,425	4,516,433	--	4,588,669	491,300				
2,060,890	--	2,133,079	245,650	4,588,670	--	4,660,907	498,525				
2,133,080	--	2,205,274	252,875	4,660,908	--	4,733,145	505,750				
2,205,275	--	2,277,472	260,100	4,733,146	--	4,805,383	512,975				
2,277,473	--	2,349,673	267,325	4,805,384	--	4,877,622	520,200				
2,349,674	--	2,421,877	274,550	4,877,623	--	4,949,861	527,425				
2,421,878	--	2,494,084	281,775	4,949,862	--	5,022,101	534,650				

For Expected Losses greater than $6,899,875, the Ballast Value can be calculated using the following formula (rounded to the nearest 1):

Ballast = (0.10)(Expected Losses) + 2500(Expected Losses)(14.45) / (Expected Losses + (700)(14.45))

G = 14.45

NATIONAL COUNCIL ON COMPENSATION INSURANCE, INC.

MISSOURI—UPDATE TO EXPERIENCE RATING PREMIUM ELIGIBILITY AMOUNTS

EXPERIENCE RATING PLAN MANUAL—2003 EDITION
RULE 2—EXPERIENCE RATING ELEMENTS AND FORMULA
A. PREMIUM ELIGIBILITY

2. State Subject Premium Eligibility Amounts

A risk qualifies for experience rating when its subject premium, developed in its experience period, meets or exceeds the minimum eligibility amount shown in the State Table of Subject Premium Eligibility Amounts in Rule 2-A-2-c. *Refer to Rule 2-E-1 to determine a risk's experience period.*

a. A risk qualifies for experience rating if its data within the most recent 24 months of the experience period develops a subject premium of at least the amount shown in Column A.

b. A risk may not qualify according to Rule 2-A-2-a. If it has more than the amount of experience referenced in Rule 2-A-2-a, then to qualify for experience rating the risk must develop an average annual subject premium of at least the amount shown in Column B. *Refer to Rule 2-A-3 to determine average annual subject premium.*

c. A risk's rating effective date determines the applicable Column A and Column B subject premium eligibility amounts required to qualify for experience rating. *Refer to Rule 2-B for rating effective date determination.*

State Table of Subject Premium Eligibility Amounts

State	Rating Effective Date	Column A ($)	Column B ($)
MO	7/1/22 and after	8,500	4,250
	7/1/21 - 6/30/22	8,000	4,000
	7/1/20 - 6/30/21	7,500	3,750

NOTE: This exhibit revises the Missouri experience rating subject premium eligibility amounts shown in the State Table of Subject Premium Eligibility Amounts in NCCI's ***Experience Rating Plan Manual*** national Rule 2-A-2. The content shown in this table is not a complete replacement of the existing State Table of Subject Premium Eligibility Amounts. The premium eligibility amounts are applicable to all policies.

MISSOURI

Advisory Loss Costs and Rating Values Filing – January 1, 2022

Proposed Values for Inclusion in the Retrospective Rating Plan Manual

The following pages include values for inclusion in the Retrospective Rating Plan Manual, such as:

- Excess loss pure premium factors
- Excess loss and allocated expense pure premium factors
- Hazard group average cost per case
- Hazard group average cost per case including ALAE

1. Average Cost per Case by Hazard Group

A	B	C	D	E	F	G
8,905	11,390	16,177	20,667	28,268	42,044	54,981

Average Cost per Case including ALAE by Hazard Group

A	B	C	D	E	F	G
9,896	12,640	17,927	22,885	31,228	46,387	60,617

2. Excess Loss Pure Premium Factors

(Applicable to New and Renewal Policies)

Per Accident Limitation	Hazard Groups A	B	C	D	E	F	G
$10,000	0.566	0.611	0.651	0.678	0.709	0.734	0.752
$15,000	0.511	0.559	0.603	0.633	0.670	0.700	0.722
$20,000	0.468	0.517	0.564	0.596	0.637	0.671	0.695
$25,000	0.432	0.482	0.530	0.564	0.609	0.644	0.672
$30,000	0.401	0.451	0.501	0.535	0.583	0.621	0.650
$35,000	0.375	0.424	0.475	0.509	0.560	0.599	0.630
$40,000	0.352	0.401	0.452	0.486	0.539	0.579	0.612
$50,000	0.315	0.362	0.412	0.447	0.502	0.544	0.579
$75,000	0.250	0.292	0.341	0.374	0.432	0.476	0.514
$100,000	0.208	0.247	0.293	0.324	0.382	0.426	0.464
$125,000	0.179	0.214	0.258	0.287	0.345	0.388	0.425
$150,000	0.157	0.190	0.232	0.259	0.316	0.357	0.394
$175,000	0.139	0.170	0.211	0.236	0.293	0.333	0.369
$200,000	0.126	0.155	0.193	0.217	0.273	0.312	0.347
$225,000	0.114	0.142	0.179	0.202	0.257	0.294	0.328
$250,000	0.105	0.131	0.167	0.188	0.242	0.279	0.312
$275,000	0.097	0.122	0.156	0.177	0.230	0.265	0.298
$300,000	0.090	0.114	0.147	0.167	0.219	0.253	0.285
$325,000	0.084	0.107	0.139	0.158	0.209	0.243	0.273
$350,000	0.079	0.100	0.132	0.150	0.200	0.233	0.263
$375,000	0.074	0.095	0.126	0.143	0.192	0.224	0.254
$400,000	0.070	0.090	0.120	0.137	0.185	0.217	0.245
$425,000	0.067	0.086	0.115	0.131	0.179	0.209	0.237
$450,000	0.063	0.082	0.110	0.126	0.173	0.203	0.230
$475,000	0.060	0.079	0.106	0.121	0.167	0.196	0.223
$500,000	0.058	0.075	0.102	0.116	0.162	0.191	0.216
$600,000	0.049	0.065	0.090	0.102	0.145	0.171	0.195
$700,000	0.043	0.057	0.080	0.091	0.132	0.156	0.178
$800,000	0.038	0.051	0.073	0.083	0.121	0.144	0.164
$900,000	0.034	0.047	0.067	0.076	0.113	0.134	0.153
$1,000,000	0.031	0.043	0.062	0.070	0.105	0.126	0.143
$2,000,000	0.017	0.024	0.037	0.042	0.066	0.080	0.092
$3,000,000	0.012	0.017	0.027	0.030	0.049	0.060	0.069
$4,000,000	0.009	0.013	0.021	0.024	0.039	0.048	0.056
$5,000,000	0.007	0.011	0.017	0.019	0.032	0.040	0.046
$6,000,000	0.006	0.009	0.014	0.016	0.027	0.034	0.040
$7,000,000	0.005	0.007	0.012	0.014	0.023	0.029	0.034
$8,000,000	0.004	0.006	0.010	0.012	0.020	0.025	0.030
$9,000,000	0.003	0.005	0.008	0.010	0.017	0.022	0.026
$10,000,000	0.003	0.004	0.007	0.009	0.015	0.019	0.023

Excess Loss and Allocated
Expense Pure Premium Factors
(Applicable to New and Renewal Policies)

Per Accident Limitation	Hazard Groups A	B	C	D	E	F	G
$10,000	0.638	0.686	0.729	0.758	0.790	0.817	0.835
$15,000	0.578	0.630	0.678	0.710	0.749	0.781	0.804
$20,000	0.530	0.584	0.635	0.670	0.714	0.750	0.776
$25,000	0.491	0.545	0.598	0.634	0.683	0.721	0.751
$30,000	0.457	0.511	0.566	0.603	0.655	0.696	0.727
$35,000	0.427	0.482	0.537	0.575	0.629	0.672	0.706
$40,000	0.402	0.456	0.511	0.550	0.606	0.650	0.686
$50,000	0.360	0.411	0.467	0.506	0.565	0.612	0.650
$75,000	0.286	0.333	0.387	0.424	0.487	0.535	0.577
$100,000	0.239	0.281	0.333	0.367	0.431	0.479	0.522
$125,000	0.205	0.245	0.293	0.325	0.389	0.436	0.478
$150,000	0.180	0.217	0.263	0.293	0.356	0.402	0.443
$175,000	0.161	0.195	0.239	0.267	0.329	0.374	0.414
$200,000	0.145	0.177	0.220	0.246	0.307	0.350	0.390
$225,000	0.132	0.162	0.204	0.229	0.289	0.330	0.369
$250,000	0.121	0.150	0.190	0.214	0.273	0.313	0.350
$275,000	0.112	0.140	0.178	0.201	0.259	0.298	0.334
$300,000	0.104	0.130	0.168	0.189	0.246	0.285	0.320
$325,000	0.098	0.123	0.159	0.179	0.235	0.273	0.307
$350,000	0.092	0.116	0.150	0.170	0.225	0.262	0.295
$375,000	0.086	0.109	0.143	0.162	0.217	0.252	0.285
$400,000	0.082	0.104	0.137	0.155	0.209	0.243	0.275
$425,000	0.078	0.099	0.131	0.149	0.201	0.235	0.266
$450,000	0.074	0.094	0.126	0.143	0.194	0.228	0.258
$475,000	0.070	0.090	0.121	0.137	0.188	0.221	0.250
$500,000	0.067	0.087	0.117	0.132	0.183	0.214	0.243
$600,000	0.057	0.075	0.102	0.116	0.163	0.192	0.219
$700,000	0.050	0.066	0.091	0.104	0.148	0.175	0.200
$800,000	0.044	0.059	0.083	0.094	0.136	0.162	0.185
$900,000	0.040	0.053	0.076	0.086	0.127	0.150	0.172
$1,000,000	0.036	0.049	0.070	0.079	0.118	0.141	0.161
$2,000,000	0.020	0.028	0.042	0.047	0.074	0.090	0.103
$3,000,000	0.014	0.020	0.030	0.034	0.056	0.067	0.077
$4,000,000	0.010	0.015	0.024	0.027	0.044	0.054	0.062
$5,000,000	0.008	0.012	0.019	0.022	0.037	0.045	0.052
$6,000,000	0.007	0.010	0.016	0.018	0.031	0.039	0.045
$7,000,000	0.006	0.008	0.014	0.016	0.027	0.033	0.039
$8,000,000	0.005	0.007	0.012	0.013	0.023	0.029	0.034
$9,000,000	0.004	0.006	0.010	0.012	0.020	0.026	0.030
$10,000,000	0.003	0.005	0.009	0.010	0.018	0.023	0.027

Part 3 Supporting Exhibits

- Exhibit I – Determination of the Indicated Loss Cost Level Change
- Exhibit II – Workers Compensation Loss Adjustment Expense
- Appendix A – Factors Underlying the Proposed Loss Cost Level Change
- Appendix B – Calculations Underlying the Loss Cost Change by Classification
- Appendix C – Memorandum for Assessment

MISSOURI

Advisory Loss Costs and Rating Values Filing – January 1, 2022

Exhibit I – Determination of the Indicated Loss Cost Level Change

NCCI utilizes the following general methodology to determine the indicated change based on experience, trend, and benefits for each of the policy years in the experience period:

1. Reported standard earned premium at the Designated Statistical Reporting (DSR) level is developed to an ultimate basis and adjusted (via on-level factors) to the current pure premium level.
2. Reported indemnity and medical losses are limited by a large loss threshold, developed to an ultimate report, and adjusted (via on-level factors) to the current benefit level.
3. Limited indemnity and medical cost ratios excluding trend and benefits are calculated as adjusted losses (step 2) divided by premium available for benefit costs (step 1).
4. Trend factors are applied to the indemnity and medical cost ratios to reflect anticipated changes in the amount of indemnity and medical benefits as compared with anticipated changes in the amount of workers' wages between (i) the years in filing's experience period and (ii) the period during which the proposed loss costs will be in effect.
5. Limited losses are adjusted to an unlimited basis via a non-catastrophe excess ratio (with excess ratios at limits beyond $50 million set equal to zero)
6. The impact of proposed indemnity and medical benefit changes is then applied.
7. The separate indemnity and medical cost ratios including benefit changes are then summed to yield the indicated change based on experience, trend, and benefits.

This filing's overall indicated change based on experience, trend and benefits is calculated as the average of the indicated changes for each of the individual policy years in the experience period. Lastly, the impact of the change in loss-based expenses is applied to determine the indicated overall average loss cost level change.

MISSOURI

EXHIBIT I

Determination of Indicated Loss Cost Level Change

Section A - Policy Year 2019 Experience

Premium:

(1)	Standard Earned Premium Developed to Ultimate (Appendix A-II)	$615,309,646
(2)	Premium On-level Factor (Appendix A-I)	0.826
(3)	Pure Premium Available for Benefit Costs = (1) x (2)	$508,245,768

Indemnity Benefit Cost:

(4)	Limited Indemnity Losses Developed to Ultimate (Appendix A-II)	$195,720,181
(5)	Indemnity Loss On-level Factor (Appendix A-I)	1.000
(6)	Adjusted Limited Indemnity Losses = (4) x (5)	$195,720,181
(7)	Adjusted Limited Indemnity Cost Ratio excluding Trend and Benefits = (6) / (3)	0.385
(8)	Factor to Reflect Indemnity Trend (Appendix A-III)	0.927
(9)	Projected Limited Indemnity Cost Ratio = (7) x (8)	0.357
(10)	Factor to Adjust Indemnity Cost Ratio to an Unlimited Basis (Appendix A-II)	1.011
(11)	Projected Indemnity Cost Ratio = (9) x (10)	0.361
(12)	Factor to Reflect Proposed Changes in Indemnity Benefits (Appendix C)	1.000
(13)	Projected Indemnity Cost Ratio including Benefit Changes = (11) x (12)	0.361

Medical Benefit Cost:

(14)	Limited Medical Losses Developed to Ultimate (Appendix A-II)	$267,444,063
(15)	Medical Loss On-level Factor (Appendix A-I)	1.000
(16)	Adjusted Limited Medical Losses = (14) x (15)	$267,444,063
(17)	Adjusted Limited Medical Cost Ratio excluding Trend and Benefits = (16) / (3)	0.526
(18)	Factor to Reflect Medical Trend (Appendix A-III)	0.956
(19)	Projected Limited Medical Cost Ratio = (17) x (18)	0.503
(20)	Factor to Adjust Medical Cost Ratio to an Unlimited Basis (Appendix A-II)	1.011
(21)	Projected Medical Cost Ratio = (19) x (20)	0.509
(22)	Factor to Reflect Proposed Changes in Medical Benefits (Appendix C)	1.000
(23)	Projected Medical Cost Ratio including Benefit Changes = (21) x (22)	0.509

Total Benefit Cost:

(24)	Indicated Change Based on Experience, Trend and Benefits = (13) + (23)	0.870

MISSOURI

EXHIBIT I

Determination of Indicated Loss Cost Level Change

Section B - Policy Year 2018 Experience

Premium:

(1)	Standard Earned Premium Developed to Ultimate (Appendix A-II)	$632,858,547
(2)	Premium On-level Factor (Appendix A-I)	0.799
(3)	Pure Premium Available for Benefit Costs = (1) x (2)	$505,653,979

Indemnity Benefit Cost:

(4)	Limited Indemnity Losses Developed to Ultimate (Appendix A-II)	$218,995,205
(5)	Indemnity Loss On-level Factor (Appendix A-I)	1.000
(6)	Adjusted Limited Indemnity Losses = (4) x (5)	$218,995,205
(7)	Adjusted Limited Indemnity Cost Ratio excluding Trend and Benefits = (6) / (3)	0.433
(8)	Factor to Reflect Indemnity Trend (Appendix A-III)	0.904
(9)	Projected Limited Indemnity Cost Ratio = (7) x (8)	0.391
(10)	Factor to Adjust Indemnity Cost Ratio to an Unlimited Basis (Appendix A-II)	1.011
(11)	Projected Indemnity Cost Ratio = (9) x (10)	0.395
(12)	Factor to Reflect Proposed Changes in Indemnity Benefits (Appendix C)	1.000
(13)	Projected Indemnity Cost Ratio including Benefit Changes = (11) x (12)	0.395

Medical Benefit Cost:

(14)	Limited Medical Losses Developed to Ultimate (Appendix A-II)	$306,572,794
(15)	Medical Loss On-level Factor (Appendix A-I)	1.000
(16)	Adjusted Limited Medical Losses = (14) x (15)	$306,572,794
(17)	Adjusted Limited Medical Cost Ratio excluding Trend and Benefits = (16) / (3)	0.606
(18)	Factor to Reflect Medical Trend (Appendix A-III)	0.941
(19)	Projected Limited Medical Cost Ratio = (17) x (18)	0.570
(20)	Factor to Adjust Medical Cost Ratio to an Unlimited Basis (Appendix A-II)	1.011
(21)	Projected Medical Cost Ratio = (19) x (20)	0.576
(22)	Factor to Reflect Proposed Changes in Medical Benefits (Appendix C)	1.000
(23)	Projected Medical Cost Ratio including Benefit Changes = (21) x (22)	0.576

Total Benefit Cost:

(24)	Indicated Change Based on Experience, Trend and Benefits = (13) + (23)	0.971

MISSOURI

EXHIBIT I

Determination of Indicated Loss Cost Level Change

Section C - Indicated Change Based on Experience, Trend, and Benefits

(1)	Policy Year 2019 Indicated Change Based on Experience, Trend, and Benefits	0.870
(2)	Policy Year 2018 Indicated Change Based on Experience, Trend, and Benefits	0.971
(3)	Indicated Change Based on Experience, Trend, and Benefits = [(1)+(2)] / 2	0.921

Section D - Application of the Change in Loss-based Expenses

(1)	Indicated Loss Cost Level Change	0.921
(2)	Effect of the Change in Loss-based Expenses (Exhibit II)	1.002
(3)	Indicated Change Modified to Reflect the Change in Loss-based Expenses = (1) x (2)	0.923

Section E - Distribution of Overall Loss Cost Level Change to Industry Groups

Industry Group Differentials (Appendix A-IV):

Manufacturing	0.998
Contracting	0.989
Office & Clerical	1.015
Goods & Services	1.002
Miscellaneous	0.999

Applying these industry group differentials to the final overall loss cost level change produces the changes in loss cost level proposed for each group as shown:

Industry Group	(1) Final Overall Loss Cost Level Change	(2) Industry Group Differential	(3) = (1) x (2) Final Loss Cost Level Change by Industry Group	
Manufacturing	0.923	0.998	0.921	(-7.9%)
Contracting	0.923	0.989	0.913	(-8.7%)
Office & Clerical	0.923	1.015	0.937	(-6.3%)
Goods & Services	0.923	1.002	0.925	(-7.5%)
Miscellaneous	0.923	0.999	0.922	(-7.8%)
Overall	0.923	1.000	0.923	(-7.7%)

Exhibit II – Workers Compensation Loss Adjustment Expense

The proposed loss costs include a provision for loss adjustment expenses (LAE).

LAE is included in the loss costs by using a ratio of loss adjustment expense dollars to loss dollars (called the "LAE provision"). These expenses are directly associated with the handling of workers compensation claims. The LAE provision is comprised of two components: Defense and Cost Containment Expenses (DCCE) and Adjusting and Other Expenses (AOE).

Given the nature of AOE, it cannot be allocated to a specific claim, and hence cannot be accurately attributed to specific states. Therefore, the Missouri-specific AOE ratio reflects a weighting of the latest selected countrywide AOE provision (which was calculated based on private carrier data) and an AOE provision calculated based on the state fund's data. The countrywide provision was calculated using data obtained from the NCCI Call for Loss Adjustment Expense. The accident year developed AOE ratios displayed in Section A are calculated on a countrywide basis using private carrier-only data after removing the reported COVID-19-related losses.

The reported DCCE and losses from COVID-19-related claims have been excluded from the underlying data in this year's analysis because that data is not expected to be predictive of the experience that may arise during the filing prospective period. NCCI used the following general methodology to determine the proposed DCCE provision based on Missouri-specific paid DCCE and losses obtained from NCCI's Policy Year Financial Call:

- Ratios of paid DCCE to paid losses by policy year are developed to an ultimate basis.
- The proposed DCCE provision is selected based on the ultimate projected DCCE ratios by policy year.

These policy year DCCE ratios were calculated using combined private carrier and state fund data.

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EXHIBIT II

Workers Compensation Loss Adjustment Expense Provision

Section A - Determination of Loss Adjustment Expense Provision

In this filing, NCCI proposes a 19.5% loss adjustment expense allowance as a percentage of losses.
The DCCE provision is based on Missouri-specific data reported to NCCI on the Policy Year Call for Experience.
The AOE provision is based on data reported to NCCI on the Call for Loss Adjustment Expense.

	Developed		Developed		
Policy Year	DCCE Ratio	Accident Year	AOE Ratio		
2015	10.1%	2016	8.5%		
2016	10.2%	2017	9.1%		
2017	9.7%	2018	9.1%		
2018	9.9%	2019	9.4%		
2019	10.0%	2020	9.8%		
Countrywide selected:			9.4%		
Missouri selected:	10.0%	+	9.5%	=	**19.5%**

Section B - Defense and Cost Containment Expense (DCCE) Ratio

(1)	(2)	(3)	(4) = (2) x (3)
Policy Year	Reported Ratio of Paid DCCE to Paid Losses	Age-to-Ultimate Development Factor	Ultimate DCCE Ratio
2015	10.5%	0.966	10.1%
2016	10.6%	0.962	10.2%
2017	10.0%	0.972	9.7%
2018	9.9%	0.997	9.9%
2019	9.3%	1.076	10.0%
		Missouri selected:	10.0%

Section C - Proposed Change in the Missouri Loss Adjustment Expense (LAE) Provision

	(5) Current	(6) Proposed
Missouri LAE Provision	19.3%	19.5%
Proposed Change in LAE Provision = [1.000 + (6)] / [1.000 + (5)] - 1		1.002 (+0.2%)

Appendix A – Factors Underlying the Proposed Loss Cost Level Change

Appendix A-I Determination of Policy Year On-level Factors

NCCI uses premium and loss on-level factors to adjust historical policy year experience to current loss cost and benefit levels, respectively.

Premium on-level factors are adjustment factors that reflect the cumulative impact of all premium level changes that have occurred during and after the individual year being on-leveled. Additional adjustments applied as part of the premium on-level factor calculation include:

- Adjustment for Expense Removal: This factor is applied to remove expenses from the reported voluntary DSR level premium totals.
- Experience Rating Off-Balance Adjustment Factor: This factor reflects the relative difference between the average experience rating modification for the historical year being on-leveled and the average experience rating modification targeted in the filing.

Loss on-level factors are adjustment factors that reflect the cumulative impact of all benefit level changes that have occurred during and after the individual year of data being on-leveled.

Note: For NCCI ratemaking purposes, proposed benefit level changes that (i) do not impact the experience period of the filing and (ii) have not yet been reflected in previous filings are included in Exhibit I, rather than in the loss on-level calculation.

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APPENDIX A-I

Determination of Policy Year On-level Factors

Section A - Factor Adjusting 2019 Policy Year Premium to Present Level

	Date	(1) Loss Cost Level Change	(2) Cumulative Index	(3) Weight	(4) Product (2)x(3)	(5) Adj. Factor Present Index/ Sum Column (4)	(6) Adj. For Expense Removal	(7) Off-balance Adjustment Factor*	(8) Premium Adjustment Factor (5)x(6)x(7)
NR	01/01/19	Base	1.000	1.000	1.000	0.994	0.838	0.992	0.826
NR	01/01/20	0.984	0.984						
NR	01/01/21	1.010	0.994						
					1.000				

Section B - Factor Adjusting 2019 Policy Year Indemnity Losses to Present Benefit Level

Date	(1) Benefit Level Change	(2) Cumulative Index	(3) Weight	(4) Product (2)x(3)	(5) Adj. Factor Present Index/ Sum Column (4)
01/01/14	Base	1.000	1.000	1.000	1.000
				1.000	

Section C - Factor Adjusting 2019 Policy Year Medical Losses to Present Benefit Level

Date	(1) Benefit Level Change	(2) Cumulative Index	(3) Weight	(4) Product (2)x(3)	(5) Adj. Factor Present Index/ Sum Column (4)
01/01/14	Base	1.000	1.000	1.000	1.000
				1.000	

NR New and renewal business.

* 0.992 = 0.952 / 0.960 = (Targeted Off-balance) / (Off-balance for Policy Year 2019)

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APPENDIX A-I

Determination of Policy Year On-level Factors

Section D - Factor Adjusting 2018 Policy Year Premium to Present Level

	Date	(1) Loss Cost Level Change	(2) Cumulative Index	(3) Weight	(4) Product (2)x(3)	(5) Adj. Factor Present Index/ Sum Column (4)	(6) Adj. For Expense Removal	(7) Off-balance Adjustment Factor*	(8) Premium Adjustment Factor (5)x(6)x(7)
NR	01/01/18	Base	1.000	1.000	1.000	0.960	0.838	0.994	0.799
NR	01/01/19	0.965	0.965						
NR	01/01/20	0.984	0.950						
NR	01/01/21	1.010	0.960						
					1.000				

Section E - Factor Adjusting 2018 Policy Year Indemnity Losses to Present Benefit Level

Date	(1) Benefit Level Change	(2) Cumulative Index	(3) Weight	(4) Product (2)x(3)	(5) Adj. Factor Present Index/ Sum Column (4)
01/01/14	Base	1.000	1.000	1.000	1.000
				1.000	

Section F - Factor Adjusting 2018 Policy Year Medical Losses to Present Benefit Level

Date	(1) Benefit Level Change	(2) Cumulative Index	(3) Weight	(4) Product (2)x(3)	(5) Adj. Factor Present Index/ Sum Column (4)
01/01/14	Base	1.000	1.000	1.000	1.000
				1.000	

NR New and renewal business.

* 0.994 = 0.952 / 0.958 = (Targeted Off-balance) / (Off-balance for Policy Year 2018)

Appendix A – Factors Underlying the Proposed Loss Cost Level Change

Appendix A-II Determination of Premium and Losses Developed to an Ultimate Report

Development factors are used to project premium and limited losses to an ultimate report. In general, the ultimate development factors are based on a chain-ladder approach that utilizes average link ratios for several maturities and the application of a tail factor.

For premium development, link ratios are used from first through fifth report, after which it is assumed no further development occurs.

For indemnity and medical loss development, link ratios are used from first through nineteenth report. For loss development beyond a nineteenth report, a “tail” factor is used to reflect all future expected emergence. Tail factors are calculated separately for indemnity and medical losses by comparing the changes in the volume of policy year losses that occur for years older than a nineteenth report to the volume of policy year losses at the nineteenth report, along with the application of a growth adjustment factor.

To limit volatility on the loss cost level indications due to the impact of large losses, a limited large loss methodology is utilized. A base threshold for the large loss limitation is determined by the volume of premium in the state as well as the number of years used in the experience period. The base threshold is detrended by policy year to reflect the inflationary impact on claim costs due to wage inflation. The wage index used is based on the Missouri average weekly wages from the Quarterly Census of Employment and Wages. Indemnity and medical losses are limited to the year-specific detrended large loss thresholds. Limited indemnity and medical losses are used to calculate estimated losses at an ultimate report. A statewide, non-catastrophe excess ratio is used to adjust the limited losses to an unlimited basis. The excess ratios are non-catastrophe because excess ratios at limits beyond $50 million are set equal to zero.

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APPENDIX A-II

Determination of Premium and Losses Developed to an Ultimate Report

Section A - Premium and Loss Summary Valued as of 12/31/2020

Policy Year 2019

(1)	Standard Earned Premium	$610,426,236
(2)	Factor to Develop Premium to Ultimate	1.008
(3)	Standard Earned Premium Developed to Ultimate = (1)x(2)	$615,309,646
(4)	Limited Indemnity Paid Losses	$56,250,726
(5)	Limited Indemnity Paid Development Factor to Ultimate	3.445
(6)	Limited Indemnity Paid Losses Developed to Ultimate = (4)x(5)	$193,783,751
(7)	Limited Indemnity Paid+Case Losses	$143,229,428
(8)	Limited Indemnity Paid+Case Development Factor to Ultimate	1.380
(9)	Limited Indemnity Paid+Case Losses Developed to Ultimate = (7)x(8)	$197,656,611
(10)	Policy Year 2019 Limited Indemnity Losses Developed to Ultimate = [(6)+(9)]/2	$195,720,181
(11)	Limited Medical Paid Losses	$183,528,497
(12)	Limited Medical Paid Development Factor to Ultimate	1.512
(13)	Limited Medical Paid Losses Developed to Ultimate = (11)x(12)	$277,495,087
(14)	Limited Medical Paid+Case Losses	$248,929,437
(15)	Limited Medical Paid+Case Development Factor to Ultimate	1.034
(16)	Limited Medical Paid+Case Losses Developed to Ultimate = (14)x(15)	$257,393,038
(17)	Policy Year 2019 Limited Medical Losses Developed to Ultimate = [(13)+(16)]/2	$267,444,063

Policy Year 2018

(1)	Standard Earned Premium	$632,226,321
(2)	Factor to Develop Premium to Ultimate	1.001
(3)	Standard Earned Premium Developed to Ultimate = (1)x(2)	$632,858,547
(4)	Limited Indemnity Paid Losses	$109,234,703
(5)	Limited Indemnity Paid Development Factor to Ultimate	1.942
(6)	Limited Indemnity Paid Losses Developed to Ultimate = (4)x(5)	$212,133,793
(7)	Limited Indemnity Paid+Case Losses	$185,280,244
(8)	Limited Indemnity Paid+Case Development Factor to Ultimate	1.219
(9)	Limited Indemnity Paid+Case Losses Developed to Ultimate = (7)x(8)	$225,856,617
(10)	Policy Year 2018 Limited Indemnity Losses Developed to Ultimate = [(6)+(9)]/2	$218,995,205
(11)	Limited Medical Paid Losses	$245,537,446
(12)	Limited Medical Paid Development Factor to Ultimate	1.258
(13)	Limited Medical Paid Losses Developed to Ultimate = (11)x(12)	$308,886,107
(14)	Limited Medical Paid+Case Losses	$300,354,867
(15)	Limited Medical Paid+Case Development Factor to Ultimate	1.013
(16)	Limited Medical Paid+Case Losses Developed to Ultimate = (14)x(15)	$304,259,480
(17)	Policy Year 2018 Limited Medical Losses Developed to Ultimate = [(13)+(16)]/2	$306,572,794

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APPENDIX A-II

Determination of Premium and Losses Developed to an Ultimate Report

Section B - Premium Development Factors

Policy Year	1st/2nd	Policy Year	2nd/3rd	Policy Year	3rd/4th	Policy Year	4th/5th
2016	1.006	2015	0.999	2014	1.001	2013	1.001
2017	1.009	2016	1.001	2015	1.000	2014	1.000
2018	1.006	2017	1.000	2016	1.001	2015	1.000
Average	1.007	Average	1.000	Average	1.001	Average	1.000

Summary of Premium Development Factors

1st/5th	2nd/5th	3rd/5th	4th/5th
1.008	1.001	1.001	1.000

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APPENDIX A-II

Determination of Premium and Losses Developed to an Ultimate Report

Section C - Limited Indemnity Paid Loss Development Factors

Policy Year	1st/2nd	Policy Year	2nd/3rd	Policy Year	3rd/4th	Policy Year	4th/5th
2017	1.812	2016	1.291	2015	1.144	2014	1.074
2018	1.735	2017	1.263	2016	1.135	2015	1.086
Average	1.774	Average	1.277	Average	1.140	Average	1.080

Policy Year	5th/6th	Policy Year	6th/7th	Policy Year	7th/8th	Policy Year	8th/9th
2013	1.040	2012	1.031	2011	1.024	2010	1.016
2014	1.061	2013	1.022	2012	1.028	2011	1.013
Average	1.051	Average	1.027	Average	1.026	Average	1.015

Policy Year	9th/10th	Policy Year	10th/11th	Policy Year	11th/12th	Policy Year	12th/13th
2009	1.012	2008	1.009	2007	1.006	2006	1.005
2010	1.016	2009	1.006	2008	1.006	2007	1.006
Average	1.014	Average	1.008	Average	1.006	Average	1.006

Policy Year	13th/14th	Policy Year	14th/15th	Policy Year	15th/16th	Policy Year	16th/17th
2005	1.004	2004	1.005	2003	1.005	2002	1.004
2006	1.012	2005	1.004	2004	1.005	2003	1.002
Average	1.008	Average	1.005	Average	1.005	Average	1.003

Policy Year	17th/18th	Policy Year	18th/19th
2001	1.003	2000	1.001
2002	1.002	2001	1.006
Average	1.003	Average	1.004

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APPENDIX A-II

Determination of Premium and Losses Developed to an Ultimate Report

Section D - Limited Medical Paid Loss Development Factors

Policy Year	1st/2nd	Policy Year	2nd/3rd	Policy Year	3rd/4th	Policy Year	4th/5th
2017	1.212	2016	1.060	2015	1.035	2014	1.015
2018	1.191	2017	1.055	2016	1.020	2015	1.024
Average	1.202	Average	1.058	Average	1.028	Average	1.020

Policy Year	5th/6th	Policy Year	6th/7th	Policy Year	7th/8th	Policy Year	8th/9th
2013	1.005	2012	1.009	2011	1.012	2010	1.007
2014	1.018	2013	1.007	2012	1.017	2011	1.011
Average	1.012	Average	1.008	Average	1.015	Average	1.009

Policy Year	9th/10th	Policy Year	10th/11th	Policy Year	11th/12th	Policy Year	12th/13th
2009	1.003	2008	1.005	2007	1.003	2006	1.003
2010	1.010	2009	1.001	2008	1.004	2007	1.001
Average	1.007	Average	1.003	Average	1.004	Average	1.002

Policy Year	13th/14th	Policy Year	14th/15th	Policy Year	15th/16th	Policy Year	16th/17th
2005	1.004	2004	1.005	2003	1.002	2002	1.011
2006	1.005	2005	1.004	2004	1.004	2003	1.004
Average	1.005	Average	1.005	Average	1.003	Average	1.008

Policy Year	17th/18th	Policy Year	18th/19th
2001	1.003	2000	1.001
2002	1.004	2001	1.003
Average	1.004	Average	1.002

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APPENDIX A-II

Determination of Premium and Losses Developed to an Ultimate Report

Section E - Limited Indemnity Paid + Case Loss Development Factors

Policy Year	1st/2nd	Policy Year	2nd/3rd	Policy Year	3rd/4th	Policy Year	4th/5th
2014	1.135	2013	1.089	2012	1.038	2011	1.033
2015	1.123	2014	1.054	2013	1.074	2012	1.019
2016	1.140	2015	1.063	2014	1.021	2013	1.040
2017	1.127	2016	1.063	2015	1.033	2014	1.028
2018	1.133	2017	1.075	2016	1.059	2015	1.021
Average	1.132	Average	1.069	Average	1.045	Average	1.028

Policy Year	5th/6th	Policy Year	6th/7th	Policy Year	7th/8th	Policy Year	8th/9th
2010	1.015	2009	1.002	2008	1.009	2007	1.014
2011	1.017	2010	1.014	2009	1.014	2008	1.008
2012	1.009	2011	1.003	2010	1.006	2009	1.001
2013	1.002	2012	1.009	2011	1.002	2010	1.000
2014	1.024	2013	1.013	2012	1.004	2011	0.997
Average	1.013	Average	1.008	Average	1.007	Average	1.004

Policy Year	9th/10th	Policy Year	10th/11th	Policy Year	11th/12th	Policy Year	12th/13th
2006	1.002	2005	0.996	2004	1.000	2003	1.008
2007	1.012	2006	1.001	2005	1.005	2004	1.011
2008	1.002	2007	1.002	2006	0.998	2005	1.004
2009	1.004	2008	1.003	2007	1.002	2006	1.002
2010	0.995	2009	0.999	2008	1.000	2007	1.002
Average	1.003	Average	1.000	Average	1.001	Average	1.005

Policy Year	13th/14th	Policy Year	14th/15th	Policy Year	15th/16th	Policy Year	16th/17th
2002	1.003	2001	0.999	2000	1.000	1999	1.001
2003	0.998	2002	0.999	2001	1.001	2000	1.000
2004	1.006	2003	1.004	2002	1.002	2001	1.000
2005	1.002	2004	1.002	2003	1.002	2002	1.001
2006	1.010	2005	1.002	2004	1.005	2003	1.004
Average	1.004	Average	1.001	Average	1.002	Average	1.001

Policy Year	17th/18th	Policy Year	18th/19th
1998	1.002	1997	1.003
1999	1.001	1998	1.000
2000	0.996	1999	1.003
2001	0.999	2000	1.001
2002	1.001	2001	1.002
Average	1.000	Average	1.002

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APPENDIX A-II

Determination of Premium and Losses Developed to an Ultimate Report

Section F - Limited Medical Paid + Case Loss Development Factors

Policy Year	1st/2nd	Policy Year	2nd/3rd	Policy Year	3rd/4th	Policy Year	4th/5th
2014	1.034	2013	0.993	2012	1.004	2011	0.993
2015	1.035	2014	0.993	2013	1.000	2012	0.998
2016	1.007	2015	1.006	2014	0.992	2013	1.000
2017	1.025	2016	0.967	2015	1.007	2014	1.008
2018	1.002	2017	0.994	2016	1.002	2015	1.002
Average	1.021	Average	0.991	Average	1.001	Average	1.000

Policy Year	5th/6th	Policy Year	6th/7th	Policy Year	7th/8th	Policy Year	8th/9th
2010	1.010	2009	1.007	2008	0.998	2007	1.004
2011	1.024	2010	1.001	2009	1.007	2008	1.008
2012	0.986	2011	0.992	2010	0.999	2009	0.996
2013	0.981	2012	0.995	2011	1.006	2010	0.998
2014	1.004	2013	1.004	2012	0.998	2011	0.993
Average	1.001	Average	1.000	Average	1.002	Average	1.000

Policy Year	9th/10th	Policy Year	10th/11th	Policy Year	11th/12th	Policy Year	12th/13th
2006	1.001	2005	0.997	2004	1.001	2003	1.004
2007	1.002	2006	1.006	2005	1.010	2004	1.005
2008	0.990	2007	0.996	2006	1.001	2005	1.002
2009	0.997	2008	0.985	2007	1.001	2006	1.003
2010	1.004	2009	0.989	2008	1.001	2007	0.999
Average	0.999	Average	0.995	Average	1.003	Average	1.003

Policy Year	13th/14th	Policy Year	14th/15th	Policy Year	15th/16th	Policy Year	16th/17th
2002	1.003	2001	1.003	2000	0.997	1999	1.004
2003	0.999	2002	1.003	2001	0.993	2000	1.000
2004	0.994	2003	1.009	2002	1.001	2001	1.000
2005	1.000	2004	0.997	2003	1.001	2002	1.002
2006	1.005	2005	0.999	2004	0.997	2003	1.002
Average	1.000	Average	1.002	Average	0.998	Average	1.002

Policy Year	17th/18th	Policy Year	18th/19th
1998	1.000	1997	0.992
1999	0.999	1998	1.000
2000	1.001	1999	0.999
2001	0.996	2000	1.003
2002	1.011	2001	1.002
Average	1.001	Average	0.999

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APPENDIX A-II

Determination of Premium and Losses Developed to an Ultimate Report

Section G - Determination of Policy Year Loss Development Factors (19th-to-Ultimate Report)

Indemnity Paid+Case Data for Matching Companies

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Policy Year	Losses for Policy Year 19th Report	Losses for Policy Year 20th Report	Losses for All Prior Policy Years Previous	Losses for All Prior Policy Years Current	Factor to Adjust Losses for Prior Policy Years	Indicated 19th-to-Ult Development for Policy Year
1991	225,355,332	225,327,519	1,968,281,792	1,970,265,933	0.630	1.014
1992	200,549,303	200,679,586	2,195,087,537	2,198,064,275	0.787	1.020
1993	183,188,006	183,535,361	2,399,277,237	2,401,159,473	0.934	1.013
1994	163,726,551	163,870,863	2,566,044,372	2,568,255,311	1.098	1.013
1995	141,313,490	141,545,426	2,727,688,854	2,729,411,452	1.309	1.011
1996	147,966,426	148,885,395	2,870,127,732	2,872,050,605	1.256	1.017
1997	154,311,500	154,746,190	3,017,195,817	3,016,590,277	1.201	1.000
1998	182,540,288	182,664,069	3,169,160,582	3,171,144,364	1.008	1.011
1999	178,274,607	178,699,133	3,218,869,043	3,221,131,468	0.987	1.015
2000	186,670,607	186,822,793	3,254,882,983	3,256,641,831	0.913	1.011
				Selected Indemnity 19th-to-Ultimate Loss Development Factor		1.012

Medical Paid+Case Data for Matching Companies

(8)	(9)	(10)	(11)	(12)	(13)	(14)
Policy Year	Losses for Policy Year 19th Report	Losses for Policy Year 20th Report	Losses for All Prior Policy Years Previous	Losses for All Prior Policy Years Current	Factor to Adjust Losses for Prior Policy Years	Indicated 19th-to-Ult Development for Policy Year
1991	191,573,815	192,847,310	1,391,708,184	1,391,806,331	0.551	1.008
1992	165,486,131	165,432,240	1,584,603,674	1,590,881,650	0.723	1.052
1993	169,737,364	170,485,300	1,756,367,002	1,757,043,235	0.775	1.010
1994	151,270,232	149,612,389	1,915,056,614	1,916,008,300	0.935	0.996
1995	134,266,425	134,657,354	2,061,176,436	2,065,782,021	1.111	1.034
1996	128,546,172	128,496,716	2,199,686,714	2,200,950,027	1.194	1.008
1997	152,933,798	153,607,274	2,327,361,810	2,327,688,399	1.021	1.006
1998	156,288,073	155,917,719	2,480,377,273	2,483,028,345	1.011	1.014
1999	162,855,364	162,873,779	2,532,868,394	2,541,678,128	0.946	1.057
2000	176,217,899	175,902,987	2,578,710,212	2,587,101,774	0.849	1.054
				Selected Medical 19th-to-Ultimate Loss Development Factor		1.020

(7) = 1 + [(3)-(2) + ((5)-(4)) / (6)] / (2)
(14) = 1 + [(10)-(9) + ((12)-(11)) / (13)] / (9)
Columns (4) and (11) are valued as of the date at which the given policy year is at a 19th report.
Columns (5) and (12) are valued as of the date at which the given policy year is at a 20th report.

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APPENDIX A-II

Determination of Premium and Losses Developed to an Ultimate Report

Section H - Derivation of Policy Year Limited 19th-to-Ultimate Loss Development Factors

Policy Year	Indemnity Paid-to-Paid + Case Ratio 19th Report	Medical Paid-to-Paid + Case Ratio 19th Report
1997	0.975	0.983
1998	0.973	0.975
1999	0.968	0.986
2000	0.989	0.959
2001	0.972	0.971
Selected	0.975	0.975

	Indemnity	Medical
(1) Paid+Case 19th-to-Ultimate Loss Development Factor (Section G)	1.012	1.020
(2) Factor to Adjust 19th-to-Ultimate Development Factor to a Limited Basis	0.778	0.778
(3) Limited Paid+Case 19th-to-Ultimate Loss Development Factor = [(1)-1]x(2)+1	1.009	1.016
(4) Limited Paid-to-Paid+Case Ratio (Section H)	0.975	0.975
(5) Limited Paid 19th-to-Ultimate Loss Development Factor = (3) / (4)	1.035	1.042

Section I - Summary of Limited Paid Loss Development Factors

	(1) Indemnity Paid Loss Development	(2)
Report	to Next Report	to Ultimate
1st	1.774	3.445
2nd	1.277	1.942
3rd	1.140	1.521
4th	1.080	1.334
5th	1.051	1.235
6th	1.027	1.175
7th	1.026	1.144
8th	1.015	1.115
9th	1.014	1.099
10th	1.008	1.084
11th	1.006	1.075
12th	1.006	1.069
13th	1.008	1.063
14th	1.005	1.055
15th	1.005	1.050
16th	1.003	1.045
17th	1.003	1.042
18th	1.004	1.039
19th		1.035

	(3) Medical Paid Loss Development	(4)
Report	to Next Report	to Ultimate
1st	1.202	1.512
2nd	1.058	1.258
3rd	1.028	1.189
4th	1.020	1.157
5th	1.012	1.134
6th	1.008	1.121
7th	1.015	1.112
8th	1.009	1.096
9th	1.007	1.086
10th	1.003	1.078
11th	1.004	1.075
12th	1.002	1.071
13th	1.005	1.069
14th	1.005	1.064
15th	1.003	1.059
16th	1.008	1.056
17th	1.004	1.048
18th	1.002	1.044
19th		1.042

(2) = Cumulative upward product of column (1).
(4) = Cumulative upward product of column (3).

Determination of Premium and Losses Developed to an Ultimate Report

Section J - Summary of Limited Paid+Case Loss Development Factors

	(1)	(2)
	Indemnity Paid+Case Loss Development	
Report	to Next Report	to Ultimate
1st	1.132	1.380
2nd	1.069	1.219
3rd	1.045	1.140
4th	1.028	1.091
5th	1.013	1.061
6th	1.008	1.047
7th	1.007	1.039
8th	1.004	1.032
9th	1.003	1.028
10th	1.000	1.025
11th	1.001	1.025
12th	1.005	1.024
13th	1.004	1.019
14th	1.001	1.015
15th	1.002	1.014
16th	1.001	1.012
17th	1.000	1.011
18th	1.002	1.011
19th		1.009

	(3)	(4)
	Medical Paid+Case Loss Development	
Report	to Next Report	to Ultimate
1st	1.021	1.034
2nd	0.991	1.013
3rd	1.001	1.022
4th	1.000	1.021
5th	1.001	1.021
6th	1.000	1.020
7th	1.002	1.020
8th	1.000	1.018
9th	0.999	1.018
10th	0.995	1.019
11th	1.003	1.024
12th	1.003	1.021
13th	1.000	1.018
14th	1.002	1.018
15th	0.998	1.016
16th	1.002	1.018
17th	1.001	1.016
18th	0.999	1.015
19th		1.016

(2) = Cumulative upward product of column (1).
(4) = Cumulative upward product of column (3).

Determination of Premium and Losses Developed to an Ultimate Report

Section K - Factor to Adjust Limited Losses to an Unlimited Basis

(1) Threshold at the Midpoint of the Loss Cost Effective Period*	10,057,697
(2) Statewide Excess Ratio for (1)	0.011
(3) Market Share for Carriers Missing from Large Loss and Catastrophe Call	0.000
(4) Factor to Adjust Limited Losses to an Unlimited Basis = 1.0 / {1.0 - [(2) x (1.0 - (3))]}	1.011

Section L - Policy Year Large Loss Limits

Experience Year	Policy Year Detrended Limit
2019	9,000,359
2018	8,688,355
2017	8,402,396
2016	8,143,470
2015	7,998,692
2014	7,831,070
2013	7,606,098
2012	7,482,017
2011	7,316,838
2010	7,132,273
2009	7,004,393
2008	7,008,915
2007	6,861,875
2006	6,579,157
2005	6,350,781
2004	6,147,900
2003	5,954,829
2002	5,809,375
2001	5,698,709
2000	5,548,460
1999	5,321,024
1998	5,101,217
1997	4,895,508

* November 30, 2022 is the midpoint of the effective period for which the revised loss costs are being proposed.

Appendix A – Factors Underlying the Proposed Loss Cost Level Change

Appendix A-III Trend Factors

NCCI applies loss ratio trend factors in the determination of the proposed overall average loss cost level change. In addition, historical changes in claim frequency and average cost per case are also reviewed.

The claim frequency and average cost per case analysis is based on the premium, losses, and lost-time claim counts reported to NCCI. Note that the medical-only claim counts are excluded from the claim frequency and severity calculations, but the losses associated with medical-only claims are included.

The lost-time claim frequency, average costs per case, and loss ratios are shown in Appendix A-III, along with the impact of the trend factor selection on each policy year in the filing's experience period. The trend lengths displayed are based on the number of years between the average accident date of the loss cost effective period and the average accident date of the respective experience period year.

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APPENDIX A-III

Policy Year Trend Factors

Section A - Summary of Policy Year Data

(1)	(2)	(3)	(4)	(5)	(6)
	Lost-Time	Indemnity		Medical	
Policy Year	Claim Frequency*	Avg Cost Per Case*^	Loss Ratio^	Avg Cost Per Case*^	Loss Ratio^
2008	22.445	23,096	0.518	29,961	0.673
2009	21.112	22,770	0.481	28,799	0.608
2010	22.308	22,959	0.512	31,120	0.695
2011	21.184	24,035	0.509	31,959	0.677
2012	20.434	23,404	0.478	31,266	0.639
2013	19.980	24,381	0.487	30,453	0.609
2014	19.424	24,245	0.471	30,811	0.599
2015	18.674	23,918	0.447	32,822	0.613
2016	17.794	24,612	0.438	32,403	0.577
2017	17.539	23,751	0.417	35,182	0.617
2018	17.515	24,720	0.433	34,606	0.606
2019	15.984	24,092	0.385	32,920	0.526

* Figures have been adjusted to the common wage level.
^ Based on an average of paid and paid+case losses.

Section B - Summary of Annual Trend Factors

	Indemnity	Medical
(1) Current Approved Annual Loss Ratio Trend Factor	0.980	0.990
(2) Selected Annual Loss Ratio Trend Factor	**0.975**	**0.985**

(3) Length of Trend Period from Midpoint of Policy Year to Midpoint of Effective Period:

	Years
Policy Year 2018	4.001
Policy Year 2019	3.001

(4) Trend Factor Applied to Experience Year = (2) ^ (3)	Indemnity	Medical
Policy Year 2018	0.904	0.941
Policy Year 2019	0.927	0.956

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APPENDIX A-IV

Derivation of Industry Group Differentials

Industry group differentials are used to more equitably distribute the overall loss cost level change based on the individual experience of each industry group. The payroll, losses and claim counts used in the calculations below are from NCCI's Workers Compensation Statistical Plan (WCSP) data.

I. Expected Losses

The current expected losses (columns (1) and (2)) are the payroll extended by the pure premiums underlying the latest loss costs. The proposed expected losses (3) are the current expected losses adjusted to the proposed level. These adjustments include the proposed experience, trend, benefit and, if applicable, loss-based expense changes as well as any miscellaneous premium adjustments.

Industry Group	(1) Latest Year Current Expected Losses Prior to Adjustment for Change in Off-Balance	(2) Five Year Current Expected Losses Prior to Adjustment for Change in Off-Balance	(3) Five Year Proposed Expected Losses Prior to Adjustment for Change in Off-Balance	(4) Current Ratio of Manual to Standard Premium	(5) Proposed Ratio of Manual to Standard Premium
Manufacturing	194,139,505	898,469,954	828,747,314	1.258	1.260
Contracting	193,085,231	876,657,792	808,646,011	1.124	1.126
Office & Clerical	112,758,527	518,469,854	478,215,396	1.140	1.138
Goods & Services	295,751,035	1,371,790,405	1,265,286,103	1.083	1.087
Miscellaneous	205,737,837	920,709,073	849,299,131	1.072	1.071
Statewide	1,001,472,135	4,586,097,078	4,230,193,955		

Industry Group	(6) Latest Year Current Expected Losses Adjusted for Change in Off-Balance (1)x(4)/(5)	(7) Five Year Current Expected Losses Adjusted for Change in Off-Balance (2)x(4)/(5)	(8) Five Year Proposed Expected Losses Adjusted for Change in Off-Balance (3)x(4)/(5)	(9) Current/ Proposed (7)/(8)	(10) Adjustment to Proposed for Current Relativity (9)IG/(9)SW
Manufacturing	193,831,347	897,043,811	827,431,842	1.084	1.000
Contracting	192,742,273	875,100,673	807,209,694	1.084	1.000
Office & Clerical	112,956,697	519,381,049	479,055,845	1.084	1.000
Goods & Services	294,662,715	1,366,742,418	1,260,630,036	1.084	1.000
Miscellaneous	205,929,936	921,568,746	850,092,128	1.084	1.000
Statewide	1,000,122,968	4,579,836,697	4,224,419,545	1.084	

II. Industry Group Differentials

To calculate the converted indicated balanced losses (11) the reported losses are limited to $500,000 for a single claim occurrence and $1,500,000 for each multiple claim occurrence. After the application of limited development, trend and benefit factors, the limited losses are brought to an unlimited level through the application of the expected excess provision. The expected excess loss provisions are non-catastrophe and the excess ratios at a loss limit of $50 million are set equal to zero. The proposed experience change, applicable loss-based expenses and any miscellaneous premium adjustments are applied to calculate the indicated losses. These indicated losses are then balanced to the expected losses using the factors shown in Appendix B-I, Section A-3.

Industry Group	(11) Converted Indicated Balanced Losses	(12) Indicated/ Expected Ratio (11)/[(8)x(10)]	(13) Indicated Differential (12)IG/(12)SW	(14) Lost-Time Claim Counts
Manufacturing	828,134,250	1.001	0.999	17,146
Contracting	799,973,395	0.991	0.989	10,103
Office & Clerical	488,640,409	1.020	1.018	9,953
Goods & Services	1,266,499,205	1.005	1.003	29,687
Miscellaneous	851,561,963	1.002	1.000	14,208
Statewide	4,234,809,222	1.002		

Industry Group	(15) Full Credibility Standard for Lost-Time Claim Counts	(16) Credibility Minimum of 1.000 and ((14)/(15))^0.5	(17) Credibility Weighted Indicated/Expected Ratio [(16)IGx(12)IG] + [1-(16)IG]x(12)SW*	(18) Final Industry Group Differential (17)IG/(17)SW
Manufacturing	12,000	1.00	1.001	0.998
Contracting	12,000	0.92	0.992	0.989
Office & Clerical	12,000	0.91	1.018	1.015
Goods & Services	12,000	1.00	1.005	1.002
Miscellaneous	12,000	1.00	1.002	0.999
Statewide			1.003	1.000

*Statewide ratio (column 17) = $\Sigma_{IG}[(6)x(17)] \div \Sigma_{IG}(6)$

Appendix B – Calculations Underlying the Loss Cost Change by Classification

NCCI separately determines voluntary loss costs for each workers compensation classification. The proposed change from the current loss cost will vary depending on the classification. The following are the general steps utilized to determine the individual classification loss costs:

1. Calculate industry group differentials, which are used to more equitably distribute the proposed overall average loss cost level change based on the individual experience of each industry group
2. For each classification, determine the indicated pure premiums based on the most recently-available five policy periods of Missouri payroll and loss experience
3. Indicated pure premiums are credibility-weighted with present on rate level pure premiums and national pure premiums to generate derived by formula pure premiums
4. Final adjustments include the application of a test correction factor, the ratio of manual-to-standard premium, and swing limits.

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APPENDIX B-I

Distribution of Loss Cost Level Change to Occupational Classification

After determining the required changes in the overall loss cost level for the state and by industry group, the next step in the ratemaking procedure is to distribute these changes among the various occupational classifications. In order to do this, the pure premiums by classification must be adjusted, by policy period, industry group, or on an overall basis, to incorporate the changes proposed in the filing. There are three sets of pure premiums for each classification: indicated, present on rate level, and national pure premiums.

Section A – Calculation of Indicated Pure Premiums

The indicated pure premiums are calculated from the payroll and loss data reported, by class code and policy period, in the Workers Compensation Statistical Plan (WCSP) for the latest available five policy periods. Various adjustments are made to these pure premiums to put them at the level proposed in this filing (Sections A-1 to A-3).

Section A-1 – Calculation of Primary Conversion Factors

1. Limited Loss Development Factors

The following factors are applied to develop the losses from first through fifth report to an ultimate basis.

Policy Period	Indemnity		Medical	
	Likely-to-Develop	Not-Likely-to-Develop	Likely-to-Develop	Not-Likely-to-Develop
7/14-6/15	1.141	1.025	1.063	1.002
7/15-6/16	1.201	1.039	1.067	1.002
7/16-6/17	1.298	1.067	1.072	1.001
7/17-6/18	1.486	1.128	1.090	1.003
7/18-6/19	1.890	1.251	1.168	1.010

2. Factors to Adjust to the Proposed Trend Level

The proposed trend factors are applied to adjust the losses to the proposed level.

Policy Period	Indemnity	Medical
7/14-6/15	0.828	0.893
7/15-6/16	0.849	0.907
7/16-6/17	0.871	0.921
7/17-6/18	0.893	0.935
7/18-6/19	0.916	0.949

3. Factors to Adjust to the Proposed Benefit Level

The following factors are applied to adjust the losses to the proposed benefit level.

Policy Period	Fatal	Permanent Total (P.T.)	Permanent Partial (P.P.)	Temporary Total (T.T.)	Medical
7/14-6/15	1.000	1.000	1.000	1.000	1.000
7/15-6/16	1.000	1.000	1.000	1.000	1.000
7/16-6/17	1.000	1.000	1.000	1.000	1.000
7/17-6/18	1.000	1.000	1.000	1.000	1.000
7/18-6/19	1.000	1.000	1.000	1.000	1.000

4. Primary Conversion Factors: Indicated Pure Premiums

The factors above, contained within Section A-1, are combined multiplicatively, resulting in the following factors for the Likely-to-Develop (L) and Not-Likely-to-Develop (NL) groupings.

Policy Period	Fatal (L)	Fatal (NL)	P.T.*	P.P. (L)	P.P. (NL)	T.T. (L)	T.T. (NL)	Medical (L)	Medical (NL)
7/14-6/15	0.945	0.849	0.945	0.945	0.849	0.945	0.849	0.949	0.895
7/15-6/16	1.020	0.882	1.020	1.020	0.882	1.020	0.882	0.968	0.909
7/16-6/17	1.131	0.929	1.131	1.131	0.929	1.131	0.929	0.987	0.922
7/17-6/18	1.327	1.007	1.327	1.327	1.007	1.327	1.007	1.019	0.938
7/18-6/19	1.731	1.146	1.731	1.731	1.146	1.731	1.146	1.108	0.958

* Permanent total losses are always assigned to the Likely-to-Develop grouping.

Section A-2 – Expected Excess Provision and Redistribution

After the application of the primary conversion factors, the limited losses are brought to an expected unlimited level through the application of excess loss factors by hazard group. The expected excess loss provisions are non-catastrophe and the excess ratios at a loss limit of $50 million are set equal to zero. These factors are shown below.

Hazard Group	A	B	C	D	E	F	G
(1) Excess Ratios	0.063	0.084	0.115	0.132	0.187	0.221	0.252
(2) Excess Factors 1/(1-(1))	1.067	1.092	1.130	1.152	1.230	1.284	1.337

As the excess loss factors are on a combined (indemnity and medical) basis, a portion (40%) of the indemnity expected excess losses are redistributed to medical in order to more accurately allocate expected excess losses. Since a portion of the expected excess losses are redistributed in an additive manner, the expected excess factors shown above cannot be combined multiplicatively with either the primary or secondary loss conversion factors.

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APPENDIX B-I

Section A-3 – Calculation of Secondary Conversion Factors

1. Factors to Adjust for Proposed Industry Group Differentials

The following factors are applied to adjust the indicated industry group differentials for the effects of credibility weighting the industry group differentials and weighting the differentials by the latest year expected losses.

	Manufacturing	Contracting	Office and Clerical	Goods and Services	Miscellaneous
(1) Indicated Differentials*	0.999	0.989	1.018	1.003	1.000
(2) Final Differentials**	0.998	0.989	1.015	1.002	0.999
(3) Adjustment (2)/(1)	0.999	1.000	0.997	0.999	0.999

*See Appendix A-IV, column (13).
**See Appendix A-IV, column (18).

2. Factors to Balance Indicated to Expected Losses

The expected losses are calculated as the pure premium underlying the current loss costs, adjusted to the proposed level and adjusted for the Experience Rating Plan off-balance. The indicated losses are balanced to the expected losses by applying the following factors.

Policy Period	(1) Adjustment of Indicated Losses to Pure Premium at Proposed Level	(2) Current Ratio of Manual to Standard Premium	(3) Proposed Ratio of Manual to Standard Premium	(4) Off-balance Adjustment (2)/(3)	(5) Balancing Indicated to Expected Losses (1)x(4)
7/14-6/15	0.915	1.130	1.131	0.999	0.914
7/15-6/16	0.931	1.129	1.130	0.999	0.930
7/16-6/17	0.934	1.129	1.129	1.000	0.934
7/17-6/18	0.911	1.129	1.124	1.004	0.915
7/18-6/19	0.922	1.129	1.127	1.002	0.924

3. Adjustment for Experience Change

A factor of 0.937 is applied to adjust for the experience change in the proposed loss cost level.

4. Factor to Reflect the Proposed Loss-Based Expense Provisions

A factor of 1.195 is applied to include the proposed loss-based expense provisions.

5. Secondary Conversion Factors: Indicated Pure Premiums

The factors above, contained within section A-3, are combined multiplicatively, resulting in the following factors:

Policy Period	Manufacturing	Contracting	Office and Clerical	Goods and Services	Miscellaneous
7/14-6/15	1.022	1.023	1.020	1.022	1.022
7/15-6/16	1.040	1.041	1.038	1.040	1.040
7/16-6/17	1.045	1.046	1.043	1.045	1.045
7/17-6/18	1.024	1.025	1.021	1.024	1.024
7/18-6/19	1.034	1.035	1.032	1.034	1.034

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APPENDIX B-I

Section B – Calculation of Present on Rate Level Pure Premiums

The present on rate level pure premiums are the pure premiums underlying the current loss costs, adjusted to the proposed level. The data sources for the above-captioned pure premiums are the partial pure premiums underlying the current loss costs.

1. Adjustment for Experience Change

A factor of 0.937 is applied to adjust for the experience change in the proposed loss cost level.

2. Factors to Adjust to the Proposed Trend Level

The pure premiums underlying the current loss costs contain the current trend. The change in trend factors, 0.983 and 0.982, for indemnity and medical, respectively, are applied to adjust to the proposed trend level.

3. Factors to Adjust to the Proposed Benefit Level

The following factors are applied to adjust the pure premiums underlying the current loss costs to the proposed benefit level.

	Indemnity	Medical
Benefit Adjustment	1.000	1.000

4. Factors to Include the Proposed Loss-Based Expense Provisions

The pure premiums underlying the current loss costs include the current loss-based expense provisions and must be adjusted to the proposed level.

	(a) Current		(b) Proposed	
	Indemnity	Medical	Indemnity	Medical
(1) Loss Adjustment Expense	1.193	1.193	1.195	1.195
(2) Overall Change (1b)/(1a)			1.002	1.002

5. Adjustment to Obtain Expected Losses

The pure premiums underlying the current loss costs reflect the current Experience Rating Plan off-balance. The change in off-balance must be applied.

Industry Group	(1) Current Ratio of Manual to Standard Premium	(2) Proposed Ratio of Manual to Standard Premium	(3) Off-balance Adjustment (1)/(2)
Manufacturing	1.258	1.260	0.998
Contracting	1.124	1.126	0.998
Office & Clerical	1.140	1.138	1.002
Goods & Services	1.083	1.087	0.996
Miscellaneous	1.072	1.071	1.001

6. Factors to Adjust for Proposed Industry Group Differentials

The pure premiums underlying the current loss costs are adjusted by the proposed industry group differentials.

Industry Group	(1) Final Differential*	(2) Adjustment to Proposed for Current Relativities**	(3) Adjusted Differential (1)x(2)
Manufacturing	0.998	1.000	0.998
Contracting	0.989	1.000	0.989
Office & Clerical	1.015	1.000	1.015
Goods & Services	1.002	1.000	1.002
Miscellaneous	0.999	1.000	0.999

*See Appendix A-IV, column (18).
**See Appendix A-IV, column (10).

7. Combined Conversion Factors

The factors above, contained within Section B, are combined multiplicatively, resulting in the following factors.

Industry Group	Indemnity	Medical
Manufacturing	0.919	0.918
Contracting	0.911	0.910
Office & Clerical	0.939	0.938
Goods & Services	0.921	0.920
Miscellaneous	0.923	0.922

Section C – Calculation of National Pure Premiums

Finally, there are the national pure premiums, which reflect the countrywide experience for each classification adjusted to state conditions. These pure premiums reflect the countrywide experience for each classification as indicated by the latest available individual classification experience for all states for which the National Council on Compensation Insurance compiles workers compensation data.

Countrywide data is adjusted to Missouri conditions in four steps. First, statewide indicated pure premiums are determined for Missouri. Second, using Missouri payrolls as weights, corresponding statewide-average pure premiums are computed for each remaining state. Third, the ratios of Missouri statewide pure premiums to those for other states are used as adjustment factors to convert losses for other states to a basis that is consistent with the Missouri indicated pure premiums. The quotient of the countrywide total of such adjusted losses divided by the total countrywide payroll for the classification is the initial pure premium indicated by national relativity. Finally, national pure premiums are balanced to the level of the state indicated pure premiums to ensure unbiased derived by formula pure premiums. Indemnity and medical pure premiums are computed separately.

Section D – Calculation of Derived by Formula Pure Premiums

The indicated, present on rate level and national pure premiums are credibility weighted, and the resulting derived by formula pure premiums are used to determine the final class loss costs.

As for the preceding pure premiums, separate computations are performed for each partial pure premium: indemnity and medical. Each partial formula pure premium is derived by the weighting of the indicated, present on rate level and national partial pure premiums. The weight assigned to the policy year indicated pure premium varies in one-percent intervals from zero percent to one hundred percent, depending upon the volume of expected losses (i.e. the product of the underlying pure premiums and the payroll in hundreds). To achieve full state credibility, a classification must have expected losses of at least: $34,873,083 for indemnity and $25,302,630 for medical.

The partial credibilities formula is:

$$z = [\text{ (expected losses) / (full credibility standard) }]^{0.5}$$

For the national pure premiums, credibility is determined from the number of lost-time claims. Full credibility standards are: 2,300 lost-time claims for indemnity and 2,000 lost-time claims for medical.

Partial credibilities are assigned using a credibility formula similar to that used for indicated pure premiums but based on the number of national cases. In no case is the national credibility permitted to exceed 50% of the complement of the state credibility.

National Credibility equals the smaller of:

$$[\text{ (national cases)/(full credibility standard) }]^{0.5} \text{ and } [\text{ (1 – state credibility)/2 }]$$

The residual credibility (100% minus the sum of the state and national credibilities) is assigned to the present on rate level pure premium.

For example, if the state credibility is 40%, the national pure premium is assigned a maximum credibility of 30% ((100-40) / 2). The remainder is assigned to the present on rate level pure premium.

The total pure premium shown on the attached Appendix B-III is obtained by adding the indemnity and medical partial pure premiums obtained above and rounding the sum to two decimal places.

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APPENDIX B-II

Adjustments to Obtain Loss Costs

The following items are combined with the derived by formula pure premium to obtain the proposed loss cost:

1. Test Correction Factor

The payrolls are now extended by the loss costs presently in effect and by the indicated loss costs to determine if the required change in manual premium level as calculated in Exhibit I has been achieved. Since at first this calculation may not yield the required results, an iterative process is initiated which continuously tests the proposed loss costs including tentative test correction factors until the required change in manual premium level is obtained. The test correction factor is applied to the derived by formula pure premiums.

The factors referred to above are set out as follows:

	Test Correction Factor
Manufacturing	1.0074
Contracting	1.0091
Office & Clerical	0.9778
Goods & Services	0.9939
Miscellaneous	1.0007

2. Ratios of Manual to Standard Premiums

The ratios of manual to standard premiums by industry group have also been excluded from the classification experience, and it is necessary to apply these factors to the derived by formula pure premiums.

	Ratio of Manual to Standard Premiums
Manufacturing	1.260
Contracting	1.126
Office & Clerical	1.138
Goods & Services	1.087
Miscellaneous	1.071

3. Disease Loadings

The proposed manual loss costs shown in this filing include specific disease loadings for those classifications where they apply. The proposed specific disease loadings are shown on the footnotes page.

4. Swing Limits

As a further step, a test is made to make certain that the proposed loss costs fall within the following departures from the present loss costs:

Manufacturing	from 12% above to 28% below
Contracting	from 11% above to 29% below
Office & Clerical	from 14% above to 26% below
Goods & Services	from 13% above to 27% below
Miscellaneous	from 12% above to 28% below

These limits have been calculated in accordance with the following formula:

Max. Deviation = Effect of the final change in loss cost level by industry group plus or minus 20% rounded to the nearest 1%.

The product of the swing limits and the present loss cost sets bounds for the proposed loss cost. If the calculated loss cost falls outside of the bounds, the closest bound is chosen as the proposed loss cost. When a code is limited, the underlying pure premiums are adjusted to reflect the limited loss cost. The classifications which have been so limited are shown below. Note that classifications that are subject to special handling may fall outside of the swing limits. A code listed below with an asterisk indicates the code's swing limit was adjusted by one cent before being applied; this is only performed when the upper and lower bounds calculated by the swing limit are equal.

An illustrative example showing the calculation of a proposed manual class loss cost is attached as Appendix B-III. This example demonstrates the manner in which the partial pure premiums are combined to produce a total pure premium, and shows the steps in the calculation at which the rounding takes place. The loss costs for other classifications are calculated in the same manner.

List of Classifications Limited by the Upper Swing	List of Classifications Limited by the Lower Swing
6213 7711	2709

5. Missouri Contracting Classification Premium Adjustment Program (CCPAP)

For classifications eligible for the CCPAP, the last step in producing the final proposed loss costs is to apply a factor of 1.090 to offset the credits payable under the CCPAP.

A list of the eligible class codes can be found under the ***Basic Manual*** state pricing programs.

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APPENDIX B-III

Derivation of Proposed Loss Cost - Code 8810

As previously explained in Appendix B-I, the indicated pure premiums are developed by adjusting the limited losses by a set of conversion factors. The converted losses are then summarized into indemnity and medical and then divided by payroll (in hundreds). The derivation of the indicated pure premium for the above-captioned classification follows:

LIMITED LOSSES (Workers Compensation Statistical Plan)

Policy Period	Fatal Likely	Fatal Not-Likely	Permanent Total	Permanent Partial Likely	Permanent Partial Not-Likely	Temporary Total Likely	Temporary Total Not-Likely	Medical Likely	Medical Not-Likely
07/01/14 - 06/30/15	0	1,000	0	2,504,789	4,548,366	760,434	1,777,915	3,100,352	10,385,814
07/01/15 - 06/30/16	100,000	80,168	0	1,992,747	3,845,789	612,047	1,764,244	2,916,384	9,714,155
07/01/16 - 06/30/17	0	386,438	0	1,109,022	4,505,826	613,943	1,653,200	1,391,639	10,354,411
07/01/17 - 06/30/18	0	0	0	1,388,857	3,625,364	515,134	1,780,917	1,983,038	12,063,650
07/01/18 - 06/30/19	0	200,000	0	2,087,055	3,771,440	661,275	1,509,592	4,014,228	13,126,732

PRIMARY CONVERSION FACTORS (Appendix B-I, Section A-1)

Policy Period	Fatal Likely	Fatal Not-Likely	Permanent Total	Permanent Partial Likely	Permanent Partial Not-Likely	Temporary Total Likely	Temporary Total Not-Likely	Medical Likely	Medical Not-Likely
07/01/14 - 06/30/15	0.945	0.849	0.945	0.945	0.849	0.945	0.849	0.949	0.895
07/01/15 - 06/30/16	1.020	0.882	1.020	1.020	0.882	1.020	0.882	0.968	0.909
07/01/16 - 06/30/17	1.131	0.929	1.131	1.131	0.929	1.131	0.929	0.987	0.922
07/01/17 - 06/30/18	1.327	1.007	1.327	1.327	1.007	1.327	1.007	1.019	0.938
07/01/18 - 06/30/19	1.731	1.146	1.731	1.731	1.146	1.731	1.146	1.108	0.958

EXPECTED EXCESS PROVISION AND REDISTRIBUTION (Appendix B-I, Section A-2)

After the application of the primary conversion factors, the limited losses are brought to an expected unlimited level through the application of a hazard group-specific excess loss factor. The factor is shown below:

	HAZARD GROUP: C
Excess Factor	1.130

As the excess loss factor is on a combined (indemnity and medical) basis, the following portion of the indemnity expected excess losses are redistributed to medical in order to more accurately allocate expected excess losses:

Redistribution %	40%

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APPENDIX B-III

Derivation of Proposed Loss Cost - Code 8810

EXPECTED UNLIMITED LOSSES (Limited Losses x Primary Conversion Factors, then adjusted for the Excess Provision and Redistribution)

Policy Period	Fatal Likely	Fatal Not-Likely	Permanent Total	Permanent Partial Likely	Permanent Partial Not-Likely	Temporary Total Likely	Temporary Total Not-Likely	Medical Likely	Medical Not-Likely
07/01/14 - 06/30/15	0	915	0	2,551,574	4,162,634	774,637	1,627,136	3,484,942	10,782,383
07/01/15 - 06/30/16	109,952	76,221	0	2,191,076	3,656,446	672,961	1,677,383	3,333,298	10,238,452
07/01/16 - 06/30/17	0	386,991	0	1,352,097	4,512,271	748,507	1,655,565	1,653,319	11,103,368
07/01/17 - 06/30/18	0	0	0	1,986,706	3,935,376	736,879	1,933,206	2,414,621	13,069,077
07/01/18 - 06/30/19	0	247,070	0	3,894,360	4,659,045	1,233,912	1,864,873	5,272,998	14,535,986

SECONDARY CONVERSION FACTORS (Appendix B-I, Section A-3)

Policy Period	INDUSTRY GROUP: Office and Clerical
07/01/14 - 06/30/15	1.020
07/01/15 - 06/30/16	1.038
07/01/16 - 06/30/17	1.043
07/01/17 - 06/30/18	1.021
07/01/18 - 06/30/19	1.032

PAYROLL, FINAL CONVERTED LOSSES (Expected Unlimited Losses x Secondary Conversion Factors)

Policy Period	Payroll	Indemnity Likely	Indemnity Not-Likely	Medical Likely	Medical Not-Likely	Total Indemnity	Total Medical	Total
07/01/14 - 06/30/15	23,214,835,870	3,392,735	5,906,499	3,554,641	10,998,031	9,299,234	14,552,672	23,851,906
07/01/15 - 06/30/16	24,771,383,876	3,087,001	5,615,632	3,459,963	10,627,513	8,702,633	14,087,476	22,790,109
07/01/16 - 06/30/17	25,545,436,964	2,190,930	6,836,685	1,724,412	11,580,813	9,027,615	13,305,225	22,332,840
07/01/17 - 06/30/18	26,608,351,754	2,780,780	5,991,822	2,465,328	13,343,528	8,772,602	15,808,856	24,581,458
07/01/18 - 06/30/19	27,662,175,772	5,292,377	6,987,660	5,441,734	15,001,138	12,280,037	20,442,872	32,722,909
Total	127,802,184,236	16,743,823	31,338,298	16,646,078	61,551,023	48,082,121	78,197,101	126,279,222
		INDICATED PURE PREMIUM				**0.038**	**0.061**	**0.10**

The pure premiums shown were calculated using unrounded losses, while the converted losses have been rounded for display purposes.

The present on rate level pure premiums are developed by adjusting the pure premiums underlying the current loss cost by the conversion factors calculated in Appendix B-I. The derivation of the present on rate level pure premiums for the above-captioned classification follows:

	Indemnity	Medical	Total
Pure Premiums Underlying Current Loss Cost	0.034	0.066	0.10
Conversion Factors (App. B-I, Section B)	0.939	0.938	xxx
PURE PREMIUMS PRESENT ON RATE LEVEL (Underlying Pure Premiums) x (Conversion Factor)	0.032	0.062	0.09

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APPENDIX B-III

Derivation of Proposed Loss Cost - Code 8810
Industry Group - Office and Clerical, Hazard Group - C

The loss cost for the above-captioned classification is derived as follows:

		Indemnity	Medical	Total
1.	Indicated Pure Premium	0.038	0.061	0.10
2.	Pure Premium Indicated by National Relativity	0.035	0.063	0.10
3.	Pure Premium Present on Rate Level	0.032	0.062	0.09
4.	State Credibilities	100%	100%	xxx
5.	National Credibilities	0%	0%	xxx
6.	Residual Credibilities = 100% - (4) - (5)	0%	0%	xxx
7.	Derived by Formula Pure Premiums = (1) x (4) + (2) x (5) + (3) x (6)	0.038	0.061	0.10
8.	Test Correction Factor	0.9778	0.9778	xxx
9.	Underlying Pure Premiums = (7) x (8) *	0.040	0.060	0.10
10.	Ratio of Manual to Standard Premium			1.138
11.	Loss Cost = (9) x (10)			0.11
12.	Loss Cost Within Swing Limits			0.11
	Current Loss Cost x Swing Limits a) Lower bound = 0.11 x 0.740 = 0.09 b) Upper bound = 0.11 x 1.140 = 0.12			
13.	Pure Premiums Underlying Proposed Loss Cost* = ((13TOT) / (9TOT)) x (9) , (13TOT) = (12) / (10)	0.040	0.060	0.10
14.	Disease, Catastrophe and/or Miscellaneous Loadings			0.00
15.	Final Loaded Loss Cost			0.11

* Indemnity pure premium is adjusted for the rounded total pure premium:
Indemnity Pure Premium = Total Pure Premium - Medical Pure Premium

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APPENDIX B-IV

Ten years of Workers Compensation Statistical Plan (WCSP) data is used to determine the F-classification (F-class) loss costs. An F-class countrywide pure premium is brought to Missouri's proposed level, and F-class code countrywide relativities are applied to determine indicated loss costs. The latest year of payroll is extended by both the current and proposed loss costs. Based on $19,443,935 of payroll, the overall indicated loss cost change in Missouri is -19.9%.

I. Calculation of F-Class Countrywide Pure Premium and F-Class Code Relativities

Ten years of F-class losses* across all states for which the National Council on Compensation Insurance compiles workers compensation ratemaking data are converted and adjusted to a countrywide level and used with ten years of F-class countrywide payroll to determine the F-class countrywide pure premiums at both an overall and individual classification level. The F-class code countrywide relativities are then calculated using these pure premiums.

*Losses are limited to $500,000 for a single claim occurrence and $1,500,000 for each multiple claim occurrence.
Note: Texas data is included for policies effective 1/1/2013 and subsequent.

A. Calculation of Primary Conversion Factors

Each state's losses are adjusted by its state-specific benefit and trend factors and countrywide development. Below are the adjustments made to Missouri's losses:

1. Factors to Adjust to a Current Benefit Level

The state and federal losses are adjusted to the current state and federal benefit levels, respectively.

State Act

Policy Period	Fatal	Permanent Total (P.T.)	Permanent Partial (P.P.)	Temporary Total (T.T.)	Medical
1/08 - 12/08	1.007	1.007	1.007	1.007	1.000
1/09 - 12/09	1.007	1.007	1.007	1.007	1.000
1/10 - 12/10	1.007	1.007	1.007	1.007	1.000
1/11 - 12/11	1.007	1.007	1.007	1.007	1.000
1/12 - 12/12	1.007	1.007	1.007	1.007	1.000
1/13 - 12/13	1.004	1.004	1.004	1.004	1.000
1/14 - 12/14	1.000	1.000	1.000	1.000	1.000
1/15 - 12/15	1.000	1.000	1.000	1.000	1.000
1/16 - 12/16	1.000	1.000	1.000	1.000	1.000
1/17 - 12/17	1.000	1.000	1.000	1.000	1.000

Federal Act

Policy Period	Fatal	Permanent Total (P.T.)	Permanent Partial (P.P.)	Temporary Total (T.T.)	Medical
1/08 - 12/08	1.000	1.000	1.000	1.000	1.000
1/09 - 12/09	1.000	1.000	1.000	1.000	1.000
1/10 - 12/10	1.000	1.000	1.000	1.000	1.000
1/11 - 12/11	1.000	1.000	1.000	1.000	1.000
1/12 - 12/12	1.000	1.000	1.000	1.000	1.000
1/13 - 12/13	1.000	1.000	1.000	1.000	1.000
1/14 - 12/14	1.000	1.000	1.000	1.000	1.000
1/15 - 12/15	1.000	1.000	1.000	1.000	1.000
1/16 - 12/16	1.000	1.000	1.000	1.000	1.000
1/17 - 12/17	1.000	1.000	1.000	1.000	1.000

2. Factors to Trend to 1/1/2022

The losses are trended from the midpoint of each policy year to 1/1/2022 using the current annual trends of 0.980 and 0.990 for indemnity and medical, respectively.

Policy Period	Indemnity	Medical
1/08 - 12/08	0.768	0.877
1/09 - 12/09	0.783	0.886
1/10 - 12/10	0.799	0.895
1/11 - 12/11	0.816	0.904
1/12 - 12/12	0.832	0.913
1/13 - 12/13	0.849	0.922
1/14 - 12/14	0.867	0.931
1/15 - 12/15	0.884	0.941
1/16 - 12/16	0.902	0.950
1/17 - 12/17	0.921	0.960

3. Limited Loss Development Factors

The losses are developed to an ultimate basis using loss development factors based on countrywide data.*

Policy Period	Indemnity		Medical	
	Likely-to-Develop	Not-Likely-to-Develop	Likely-to-Develop	Not-Likely-to-Develop
1/08 - 12/08	1.045	1.006	1.111	1.012
1/09 - 12/09	1.048	1.013	1.119	1.028
1/10 - 12/10	1.057	1.020	1.128	1.027
1/11 - 12/11	1.067	1.031	1.127	1.020
1/12 - 12/12	1.058	1.029	1.132	1.010
1/13 - 12/13	1.088	1.040	1.134	1.024
1/14 - 12/14	1.113	1.054	1.176	1.023
1/15 - 12/15	1.281	1.109	1.250	1.024
1/16 - 12/16	1.481	1.254	1.316	1.060
1/17 - 12/17	2.325	1.810	1.527	1.135

*Excludes Texas.

4. Primary Conversion Factors = (1) x (2) x (3)

The factors above, contained within Section A, are combined multiplicatively, resulting in the following Likely-to-Develop (L) and Not-Likely-to-Develop (NL) factors:

State Act

Policy Period	Fatal (L)	Fatal (NL)	P.T.*	P.P. (L)	P.P. (NL)	T.T. (L)	T.T. (NL)	Medical (L)	Medical (NL)
1/08 - 12/08	0.808	0.778	0.808	0.808	0.778	0.808	0.778	0.974	0.888
1/09 - 12/09	0.826	0.799	0.826	0.826	0.799	0.826	0.799	0.991	0.911
1/10 - 12/10	0.850	0.821	0.850	0.850	0.821	0.850	0.821	1.010	0.919
1/11 - 12/11	0.877	0.847	0.877	0.877	0.847	0.877	0.847	1.019	0.922
1/12 - 12/12	0.886	0.862	0.886	0.886	0.862	0.886	0.862	1.034	0.922
1/13 - 12/13	0.927	0.886	0.927	0.927	0.886	0.927	0.886	1.046	0.944
1/14 - 12/14	0.965	0.914	0.965	0.965	0.914	0.965	0.914	1.095	0.952
1/15 - 12/15	1.132	0.980	1.132	1.132	0.980	1.132	0.980	1.176	0.964
1/16 - 12/16	1.336	1.131	1.336	1.336	1.131	1.336	1.131	1.250	1.007
1/17 - 12/17	2.141	1.667	2.141	2.141	1.667	2.141	1.667	1.466	1.090

Federal Act

Policy Period	Fatal (L)	Fatal (NL)	P.T.*	P.P. (L)	P.P. (NL)	T.T. (L)	T.T. (NL)	Medical (L)	Medical (NL)
1/08 - 12/08	0.803	0.773	0.803	0.803	0.773	0.803	0.773	0.974	0.888
1/09 - 12/09	0.821	0.793	0.821	0.821	0.793	0.821	0.793	0.991	0.911
1/10 - 12/10	0.845	0.815	0.845	0.845	0.815	0.845	0.815	1.010	0.919
1/11 - 12/11	0.871	0.841	0.871	0.871	0.841	0.871	0.841	1.019	0.922
1/12 - 12/12	0.880	0.856	0.880	0.880	0.856	0.880	0.856	1.034	0.922
1/13 - 12/13	0.924	0.883	0.924	0.924	0.883	0.924	0.883	1.046	0.944
1/14 - 12/14	0.965	0.914	0.965	0.965	0.914	0.965	0.914	1.095	0.952
1/15 - 12/15	1.132	0.980	1.132	1.132	0.980	1.132	0.980	1.176	0.964
1/16 - 12/16	1.336	1.131	1.336	1.336	1.131	1.336	1.131	1.250	1.007
1/17 - 12/17	2.141	1.667	2.141	2.141	1.667	2.141	1.667	1.466	1.090

*Permanent Total losses are always assigned to the Likely-to-Develop grouping.

B. Expected Excess Provision and Redistribution

After the application of the primary conversion factors, each state's limited losses are brought to an expected unlimited level through the application of countrywide excess loss factors by hazard group. The expected excess loss provisions are non-catastrophe and the excess ratios at a loss limit of $50 million are set equal to zero. The countrywide excess loss factors are shown below:

Hazard Group	A	B	C	D	E	F	G
(1) **Excess Ratios**	0.079	0.101	0.134	0.151	0.207	0.240	0.274
(2) = 1/(1-(1)) **Excess Factors**	1.086	1.112	1.155	1.178	1.261	1.316	1.377

As the excess loss factors are on a combined (indemnity and medical) basis, a portion (40%) of the indemnity expected excess losses are redistributed to medical in order to more accurately allocate expected excess losses. Since a portion of the expected excess losses are redistributed in an additive manner, the expected excess factors shown above cannot be combined multiplicatively with the primary loss conversion factors.

C. Calculation of Total Expected Unlimited Losses

Using expected unlimited losses, each state's total losses at the countrywide level are a combination of its federal act losses and its state act losses adjusted to the countrywide level.

State act losses are adjusted to a common countrywide level for each state using its state-specific index to countrywide factor by using the steps below:

1. Each state's Hazard Group E average pure premium is calculated by payroll weighting the pure premiums of the industrial codes in Hazard Group E. The average pure premium for Hazard Groups F and G are calculated in a similar manner.
2. Each state's industrial average pure premium is calculated by weighting together the state's hazard group average pure premiums (step 1) by the F-class countrywide payroll distribution of Hazard Groups E, F, and G.
3. The countrywide industrial average pure premium is calculated by payroll weighting each state's industrial average pure premium (step 2) by its respective F-class payroll.
4. Each state's index to countrywide factor is the ratio of the industrial countrywide average pure premium (step 3) to its respective industrial average pure premium (step 2).
5. The adjusted state act losses for each state are calculated by applying the state-specific index to countrywide factor to its state act expected unlimited losses. Missouri's index to countrywide factor is 0.684.

D. F-Class Countrywide Pure Premium and F-Class Code Relativities

All states' expected unlimited losses at the countrywide level are summed to determine the F-class overall countrywide pure premium, F-class code countrywide pure premiums, and F-class code countrywide relativities.

	(1)	(2)	(3) = (2) / ((1)/100)	(4) = (3) / (3)CW
Class Code	**10-Year Countrywide Payroll**	**10-Year Expected Unlimited Countrywide Losses**	**Countrywide Pure Premium**	**Countrywide Relativity**
6006	285,475,380	13,842,243	4.85	1.410
6801*	24,801,350	385,828	1.56	1.000
6824	474,818,380	18,772,950	3.95	1.148
6825	289,698,605	3,107,916	1.07	0.311
6826	130,250,844	2,914,882	2.24	0.651
6828*	42,894,518	577,268	1.35	1.000
6829*	17,179,079	557,027	3.24	1.000
6843	1,356,336,819	64,095,958	4.73	1.375
6845	248,031,406	6,194,045	2.50	0.727
6872	1,556,953,017	70,722,752	4.54	1.320
6873*	33,450,087	1,693,252	5.06	1.000
6874	113,627,635	6,175,783	5.44	1.581
7309	901,526,126	37,208,286	4.13	1.201
7313	670,874,776	11,325,737	1.69	0.491
7317	1,159,322,995	36,038,706	3.11	0.904
7327	55,654,194	5,073,036	9.12	2.651
7350	644,701,195	20,158,860	3.13	0.910
8709	381,840,788	5,825,272	1.53	0.445
8726	678,866,423	6,787,249	1.00	0.291
9077*	1,120,828	436,201	38.92	1.000
Overall	**9,067,424,445**	**311,893,251**	**3.44**	

*Relativities for class codes with a limited amount of data are set to 1.000.

II. Calculation of Missouri's F-Class Base Pure Premiums

Missouri's primary, secondary, and final base pure premiums are calculated to bring the F-class overall countrywide pure premium to Missouri's proposed level.

A. Primary Base Pure Premium Factors

Using the factors below, Missouri's primary base pure premium is calculated to bring the F-class overall countrywide pure premium to Missouri's level:

1. State Act Pure Premium Relativity Factor 1.462

Calculated as 1 / Missouri's index to countrywide factor (Section I.C)

2. Countrywide State and Federal Weights

Countrywide state and federal losses are used to determine the weights.

i. State Act Weight (St%) 24%
ii. Federal Act Weight (Fed%) 76%

B. Secondary Base Pure Premium Factors

Using the factors below, Missouri's secondary base pure premium is calculated to incorporate Missouri's proposed trends, benefits, and loss-based expenses on an indemnity and medical basis:

1. Countrywide Indemnity and Medical Weights

Countrywide indemnity and medical losses are used to determine the weights.

i. Indemnity Weight 49%
ii. Medical Weight 51%

2. Indemnity and Medical Trend Factors

Missouri's primary base pure premium is trended from 1/1/2022 to the midpoint of the proposed period using the proposed annual trends of 0.975 and 0.985 for indemnity and medical, respectively.

i. Indemnity Trend Factor 0.977
ii. Medical Trend Factor 0.986

3. Indemnity and Medical Benefits

Missouri's primary base pure premium is adjusted to proposed state and federal benefit levels using countrywide state and federal weights (Section A.2).

	Indemnity	Medical
(a) State Benefits	1.000	1.000
(b) Federal Benefits	1.000	1.000
Weighted Benefits = [(a) x St%] + [(b) x Fed%]	1.000	1.000

4. Loss-Based Expenses

Missouri's primary base pure premium is adjusted by the weighted impact of the proposed state and federal loss-based expenses. The countrywide state and federal weights (Section A.2) are used to determine the weighted effects.

	Indemnity	Medical
(a) State Act Loss Adjustment Expense	1.195	1.195
(b) State Act Loss-Based Assessment	1.000	1.000
(c) Federal Act Loss Adjustment Expense	1.195	1.195
(d) Federal Act Loss-Based Assessment	1.115	1.000
(e) State Act Total = (a) + (b) - 1	1.195	1.195
(f) Federal Act Total = (c) +(d) - 1	1.310	1.195
Weighted Loss-Based Expenses = [(e) x St%] + [(f) x Fed%]	1.282	1.195

C. Final Base Pure Premium Factors

The following factors are applied to determine Missouri's final base pure premium:

1. Additional Offsets 1.000

There are no additional offsets applicable in Missouri.

III. Calculation of Missouri's Proposed Loss Costs by Class Code

The proposed loss costs are calculated by applying the items below to Missouri's final base pure premium.

A. Application of F-Class Code Relativities

Loss costs are calculated for each of Missouri's F-class codes by applying the respective F-class code countrywide relativity factor (Section I.D) to Missouri's final base pure premium.

B. Class Code 9077

Class Code 9077 is calculated as described in Sections I and II but using non-appropriated benefit changes and federal loss-based expenses.

C. Swing Limits

The proposed loss costs are limited to the swing limits based on 20% above and 20% below the current loss costs.

Classifications Limited by the Upper Swing	Classifications Limited by the Lower Swing
9077	6825 6826 6872 6874 7309 7313 7317 7327 7350 8709 8726

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APPENDIX B-IV

Derivation of State Base Pure Premium

	Indemnity	Medical	Total
1. Overall Countrywide Pure Premium (Section I.D)			3.44
2. State Act Pure Premium Relativity Factor (Section II.A.1)			1.462
3. Countrywide State Act Weight (Section II.A.2)			24%
4. **Primary Base Pure Premium** =[(1) x (2) x (3)] + [(1) x (1 - (3))]			**3.82**
5. Countrywide Weights (Section II.B.1)	49%	51%	100%
6. Trend Factors (Section II.B.2)	0.977	0.986	xx
7. Weighted Benefits (Section II.B.3)	1.000	1.000	xx
8. Weighted Loss-Based Expenses (Section II.B.4)	1.282	1.195	xx
9. **Secondary Base Pure Premium** = (4tot) x (5) x (6) x (7) x (8)	2.344	2.296	**4.64**
10. Additional Offsets (Section II.C.1)			1.000
11. **Final Base Pure Premium** = (9) x (10)			**4.64**

MISSOURI

APPENDIX B-IV

Derivation of Proposed Loss Cost - Code 6872
Industry Group - F-Class, Hazard Group - G

The loss cost for the above-captioned classification is derived as follows:

1. Missouri's Final Base Pure Premium	4.64
2. Countrywide Class Code 6872 Relativity (Section I.D)	1.320
3. Loss Cost = (1) x (2)	6.12
4. Loss Cost Within Swing Limits	7.30
Current Loss Cost x Swing Limits a) Lower bound = 9.12 x 0.80 = 7.30 a) Upper bound = 9.12 x 1.20 = 10.94	
5. Disease, Catastrophe and/or Miscellaneous Loadings	0.00
6. Final Loaded Loss Cost	7.30

MISSOURI

APPENDIX B-V

Derivation of Proposed Traumatic Loss Cost - Code 1016

As previously explained in Appendix B-I, the indicated pure premiums are developed by adjusting the limited losses by a set of conversion factors. The converted losses are then summarized into indemnity and medical and then divided by payroll (in hundreds). The derivation of the indicated pure premium for classification 1016 follows:

LIMITED LOSSES (Workers Compensation Statistical Plan)

Policy Period	Fatal Likely	Fatal Not-Likely	Permanent Total	Permanent Partial Likely	Permanent Partial Not-Likely	Temporary Total Likely	Temporary Total Not-Likely	Medical Likely	Medical Not-Likely
07/01/14 - 06/30/15	0	0	0	0	0	0	0	0	7,277
07/01/15 - 06/30/16	0	0	0	0	0	0	0	0	0
07/01/16 - 06/30/17	0	0	0	0	0	0	73,893	0	41,827
07/01/17 - 06/30/18	0	0	0	0	0	0	0	0	0
07/01/18 - 06/30/19	0	0	0	0	0	0	0	0	0

PRIMARY PARTIAL CONVERSION FACTORS (Appendix B-I, Section A-1)

Policy Period	Fatal Likely	Fatal Not-Likely	Permanent Total	Permanent Partial Likely	Permanent Partial Not-Likely	Temporary Total Likely	Temporary Total Not-Likely	Medical Likely	Medical Not-Likely
07/01/14 - 06/30/15	0.945	0.849	0.945	0.945	0.849	0.945	0.849	0.949	0.895
07/01/15 - 06/30/16	1.020	0.882	1.020	1.020	0.882	1.020	0.882	0.968	0.909
07/01/16 - 06/30/17	1.131	0.929	1.131	1.131	0.929	1.131	0.929	0.987	0.922
07/01/17 - 06/30/18	1.327	1.007	1.327	1.327	1.007	1.327	1.007	1.019	0.938
07/01/18 - 06/30/19	1.731	1.146	1.731	1.731	1.146	1.731	1.146	1.108	0.958

EXPECTED EXCESS PROVISION AND REDISTRIBUTION (Appendix B-I, Section A-2)

After the application of the primary conversion factors, the limited losses are brought to an expected unlimited level through the application of a hazard group-specific excess loss factor. The factor is shown below:

	HAZARD GROUP: G
Excess Factor	1.337

As the excess loss factor is on a combined (indemnity and medical) basis, the following portion of the indemnity expected excess losses are redistributed to medical in order to more accurately allocate expected excess losses:

Redistribution %	40%

MISSOURI

APPENDIX B-V

Derivation of Proposed Traumatic Loss Cost - Code 1016

EXPECTED UNLIMITED LOSSES (Limited Losses x Primary Conversion Factors, then adjusted for the Excess Provision and Redistribution)

Policy Period	Fatal Likely	Fatal Not-Likely	Permanent Total	Permanent Partial Likely	Permanent Partial Not-Likely	Temporary Total Likely	Temporary Total Not-Likely	Medical Likely	Medical Not-Likely
07/01/14 - 06/30/15	0	0	0	0	0	0	0	0	8,707
07/01/15 - 06/30/16	0	0	0	0	0	0	0	0	0
07/01/16 - 06/30/17	0	0	0	0	0	0	82,523	0	60,807
07/01/17 - 06/30/18	0	0	0	0	0	0	0	0	0
07/01/18 - 06/30/19	0	0	0	0	0	0	0	0	0

SECONDARY PARTIAL CONVERSION FACTOR (Loss-based expense, if applicable)

	Indemnity	Medical
Loss Based Expense	1.195	1.195

PAYROLL, FINAL CONVERTED LOSSES (Expected Unlimited Losses x Loss-Based Expenses, if applicable)

Policy Period	Payroll	Indemnity Likely	Indemnity Not-Likely	Medical Likely	Medical Not-Likely	Total Indemnity	Total Medical	Total
07/01/14 - 06/30/15	10,773	0	0	0	10,405	0	10,405	10,405
07/01/15 - 06/30/16	0	0	0	0	0	0	0	0
07/01/16 - 06/30/17	46,646	0	98,615	0	72,664	98,615	72,664	171,279
07/01/17 - 06/30/18	3,084	0	0	0	0	0	0	0
07/01/18 - 06/30/19	55,471	0	0	0	0	0	0	0
Total	115,974	0	98,615	0	83,069	98,615	83,069	181,684
		INDICATED PURE PREMIUM				**85.032**	**71.627**	**156.66**

The pure premiums shown were calculated using unrounded losses, while the converted losses have been rounded for display purposes.

The present on rate level pure premiums are developed by adjusting the pure premiums underlying the current loss cost by the conversion factors calculated in Appendix B-I. The derivation of the present on rate level pure premiums for the above-captioned classification follows:

	Indemnity	Medical	Total
Pure Premiums Underlying Current Loss Cost	6.082	5.738	11.82
Conversion Factors *	0.985	0.984	xxx
PURE PREMIUMS PRESENT ON RATE LEVEL (Underlying Pure Premiums) x (Conversion Factor)	5.991	5.646	11.64

* Conversion factors only adjust for changes in trend, benefit, and if applicable, loss-based expense provision.

MISSOURI

APPENDIX B-V

Derivation of Proposed Traumatic Loss Cost - Code 1016
COAL MINING—NOC, Hazard Group - G

The traumatic loss cost for classification 1016 is derived as follows:

		Indemnity	Medical	Total
1.	Indicated Pure Premium	85.032	71.627	156.66
2.	Pure Premium Indicated by National Relativity	5.540	5.172	10.71
3.	Pure Premium Present on Rate Level	5.991	5.646	11.64
4.	State Credibilities†	1%	1%	xxx
5.	National Credibilities	49%	49%	xxx
6.	Residual Credibilities = 100% - (4) - (5)	50%	50%	xxx
7.	Derived by Formula Pure Premiums = (1) x (4) + (2) x (5) + (3) x (6)	6.560	6.074	12.63
8.	Voluntary Offset	1.000	1.000	xxx
9.	Underlying Pure Premiums = (7) x (8) *	6.556	6.074	12.63
10.	Ratio of Manual to Standard Premium			1.071
11.	Loss Cost = (9) x (10)			13.53
12.	Loss Cost Within Swing Limits			13.53
	Current Loss Cost x Swing Limits a) Lower bound = 12.67 x 0.80 = 10.14 b) Upper bound = 12.67 x 1.20 = 15.20			
13.	Pure Premiums Underlying Proposed Loss Cost* = ((13TOT) / (9TOT)) x (9) , (13TOT) = (12) / (10)	6.556	6.074	12.63
14.	Proposed Traumatic Loss Cost			13.53

† To achieve full state credibility, the classification must have expected losses of at least: $119,379,742 for indemnity, and $52,452,319 for medical

* Indemnity pure premium is adjusted for the rounded total pure premium:
Indemnity Pure Premium = Total Pure Premium - Medical Pure Premium

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APPENDIX B-V

Coal Mine Occupational Disease
Proposed Underground and Surface Loss Costs

Part A - State Occupational Disease (OD) Pure Premium*

1. Estimated Number of Claims per Year	5
2. Estimated Average Cost per Claim	$75,000
3. Estimated Cost of State Act Disease Claims per Year = (1) x (2)	$375,000
4. Estimated Coal Miner Payroll	$753,912,921
5. State OD Pure Premium per $100 of Payroll = (3) / (4) x 100	0.05

Part B - Federal Occupational Disease (OD) Pure Premium**

6. Estimated Entitlements for Claims Filed by Living Miners	25
7. Average Cost per Case for Living Miners	$461,375
8. Cost of Claims Filed by Living Miners = (6) x (7)	$11,534,375
9. Estimated Entitlements for Claims Filed by Living Widows	3
10. Average Cost per Case for Living Widows	$276,850
11. Cost of Claims Filed by Living Widows = (9) x (10)	$830,550
12. Total Cost of Federal Claims (8) + (11)	$12,364,925
13. Estimated Coal Miner Payroll	$954,550,850
14. Federal OD Pure Premium per $100 of Payroll = (12) / (13) x 100	1.30

Part C - Split Total Occupational Disease (OD) Pure Premium by Class Code

15. Code 1016 OD Costs Relative to Code 1005 Costs	3.000
16. Distribution of Coal Mining Payroll**	
a) 1005 Payroll as % of Total Coal Mining Payroll	41.9%
b) 1016 Payroll as % of Total Coal Mining Payroll	58.1%
17. Proposed State OD Pure Premiums	
a) 1005 State OD Pure Premium = (5) / [(16a) + (16b) x (15)]	0.02
b) 1016 State OD Pure Premium = (17a) x (15)	0.06
18. Proposed Federal OD Pure Premiums	
a) 1005 Federal OD Pure Premium = (14) / [(16a) + (16b) x (15)]	0.60
b) 1016 Federal OD Pure Premium = (18a) x (15)	1.80
19. Loss-Based Expense Provision	1.195
20. Proposed State OD Loss Cost	
a) 1005 State OD Loss Cost = (17a) x (19)	0.02
b) 1016 State OD Loss Cost = (17b) x (19)	0.07
21. Proposed Federal OD Loss Cost	
a) 1005 Federal OD Loss Cost = (18a) x (19)	0.72
b) 1016 Federal OD Loss Cost = (18b) x (19)	2.15

* Based on a review of data for all NCCI states excluding IL, KY, VA, and WV
** Based on a review of data for all NCCI states excluding KY, VA, and WV

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Appendix C – Memorandum for Assessment

Appendix C includes detail on the most recent Longshore and Harbor Workers' Compensation Act assessment.

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APPENDIX C-I

U.S. Longshore and Harbor Workers' Compensation Act Assessment

The F-class and Program II, Option II maritime class voluntary loss costs include the following provision for the federal assessment:

1.)	Estimated Total Expense Needed for 2020 *	94,000,000
2.)	Compensation Payments Reported (on indemnity only) in 2019 *	820,509,290
3.)	Assessment Rate on Indemnity Losses (1) / (2)	11.5%

Breakdown of Losses Under the Longshore and Harbor Workers Act

4.)	Indemnity Losses (Combination of 1st through 3rd reports) #	39,408,883
5.)	Medical Losses (Combination of 1st through 3rd reports) #	33,568,865
6.)	Total Losses (4) + (5)	72,977,748
7.)	Assessment Rate on Total Losses { (3) x (4) } / (6)	6.2%

* Source: U.S. Department of Labor

\# Source: On-leveled and developed USL&HW losses - statistical plan data

Part 4 Additional Information

- Definitions
- NCCI Affiliate List
- Key Contacts

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Definitions

Accident Year (AY): A loss accounting definition in which experience is summarized by the calendar year in which an accident occurred.

Calendar Year (CY):

- The 12-month period beginning January 1 and ending December 31.
- Method of accounting for all financial transactions occurring during a specific year.

Case Reserves: Reserves that an insurance company establishes for specific (known) claims.

DSR Level Premium: The standard earned premium that would result if business were written at NCCI state-approved loss costs or rates instead of at the company rates. It is the common benchmark level at which carriers report premium on the Financial Calls.

Frequency: The number of lost-time claims per million dollars of on-leveled, wage-adjusted premium.

Incurred Claim Count: The total of all claims reported, whether open or closed, as of a given valuation date. An indemnity claim is associated with a payment or case reserve for an indemnity loss (i.e., lost work time-related benefits) and excludes claims closed without an indemnity payment.

Lost-time Claims: Claims where an injured employee has received wage replacement benefits due to a compensable workplace injury.

Limited Losses: Losses that result after the application of NCCI's large loss procedure—in which individual large claims are limited to jurisdiction and year-specific large loss thresholds.

On-Level Factor: Applied to historical premiums and losses to adjust the historical experience to reflect approved loss cost/rate level changes as well as statutory benefit level changes implemented since that time.

Paid+Case Losses: The sum of paid losses and case reserves. Also known as “case incurred losses.”

Paid Losses: Losses that an insurance company has paid as a result of claim activity.

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Definitions

Policy Year:

- The one-year period beginning with the effective date or anniversary of a policy.
- A premium and loss accounting definition in which experience is summarized for all policies with effective dates in a given calendar year period.

Severity: The average cost per case (claim) calculated as ultimate losses divided by ultimate lost-time claim counts.

Ultimate Development Factor: For an aggregation of data, an estimate of the development that will occur between the data's current valuation date and the time when all claims are closed.

Unlimited Losses: Losses that have not been limited to jurisdiction and year-specific large loss thresholds as part of NCCI's large loss procedure.

Valuation Date: The date that premiums and losses are evaluated for reporting purposes. Premiums and losses may change over time from initial estimates to final values. Therefore, interim snapshots have associated valuation dates.

Wage Level Adjustment Factor: The ratio of the average workers' wages during the most recent time period to the average workers' wages during a historical time period.

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NCCI Affiliate List

7710 INSURANCE COMPANY
A M C O INSURANCE COMPANY
ACADIA INSURANCE COMPANY
ACCIDENT FUND GENERAL INS CO
ACCIDENT FUND INS CO OF AMERICA
ACCIDENT FUND NATIONAL INS CO
ACCIDENT INSURANCE COMPANY INC
ACE AMERICAN INSURANCE COMPANY
ACE FIRE UNDERWRITERS INSURANCE COMPANY
ACE PROPERTY & CASUALTY INSURANCE COMPANY
ACIG INS CO
ACUITY A MUTUAL INS COMPANY
ADDISON INSURANCE COMPANY
AIG ASSURANCE COMPANY
AIG PROPERTY CASUALTY COMPANY
AIU INSURANCE CO (NATIONAL UNION FIRE OF PITTS PA)
AK NATIONAL INS CO
ALLIED EASTERN IND CO
ALLIED INSURANCE COMPANY OF AMERICA
ALLIED PROPERTY AND CASUALTY INS CO
ALLMERICA FINANCIAL ALLIANCE INS CO
ALLMERICA FINANCIAL BENEFIT INS CO
AMERICAN ALTERNATIVE INSURANCE CORPORATION
AMERICAN AUTOMOBILE INSURANCE CO
AMERICAN BUSINESS AND MERCANTILE INS MUTUAL INC
AMERICAN CASUALTY COMPANY OF READING P A
AMERICAN COMPENSATION INS CO
AMERICAN ECONOMY INS CO
AMERICAN FAMILY HOME INS CO
AMERICAN FAMILY INS CO
AMERICAN FAMILY MUTUAL INSURANCE COMPANY, S.I.
AMERICAN FIRE AND CASUALTY CO
AMERICAN GUARANTEE AND LIABILITY INS CO
AMERICAN HOME ASSUR CO-NATIONAL UNION FIRE OF PIT
AMERICAN INS CO
AMERICAN INTERSTATE INS CO
AMERICAN LIBERTY INSURANCE CO
AMERICAN MODERN HOME INS CO
AMERICAN NATIONAL PROPERTY AND CASUALTY CO
AMERICAN SELECT INS CO
AMERICAN STATES INS CO A SAFECO COMPANY
AMERICAN ZURICH INS CO
AMERISURE INS CO
AMERISURE MUTUAL INS CO
AMERISURE PARTNERS INS CO
AMERITRUST INS CORP
AMFED ADVANTAGE INSURANCE COMPANY
AMFED CASUALTY INS CO
AMFED NATIONAL INSURANCE COMPANY
AMGUARD INS CO
AMTRUST INSURANCE CO
ARCH INDEMNITY INSURANCE COMPANY
ARCH INSURANCE COMPANY
ARCH PROPERTY CASUALTY INS CO
ARGONAUT GREAT CENTRAL INS CO
ARGONAUT INS CO
ARGONAUT MIDWEST INS CO
ASSOCIATED INDEMNITY CORP
ASSOCIATION CASUALTY INS CO
ATLANTIC SPECIALTY INS CO (INTACT)
AUSTIN MUTUAL INSURANCE COMPANY
AUTO OWNERS INS CO
BANKERS STANDARD INS CO
BEARING MIDWEST CASUALTY COMPANY
BENCHMARK INSURANCE COMPANY
BERKLEY CASUALTY COMPANY
BERKLEY INSURANCE COMPANY
BERKLEY NATIONAL INSURANCE COMPANY
BERKLEY REGIONAL INS CO
BERKSHIRE HATHAWAY DIRECT INSURANCE COMPANY
BERKSHIRE HATHAWAY HOMESTATE INS CO
BITCO GENERAL INSURANCE CORPORATION
BITCO NATIONAL INSURANCE COMPANY
BLACKBOARD INSURANCE COMPANY
BLOOMINGTON COMPENSATION INS CO
BRICKSTREET MUTUAL INS CO
BROTHERHOOD MUTUAL INS CO
CALIFORNIA INSURANCE COMPANY
CAPITOL INDEMNITY CORP
CAROLINA CASUALTY INS CO
CHARTER OAK FIRE INS CO
CHEROKEE INS CO
CHIRON INSURANCE COMPANY
CHUBB INDEMNITY INS CO
CHUBB NATIONAL INS CO
CHURCH MUTUAL INS CO, S.I.
CIMARRON INSURANCE COMPANY INC
CINCINNATI CASUALTY COMPANY
CINCINNATI INDEMNITY COMPANY
CINCINNATI INS CO
CITIZENS INS CO OF AMERICA
CLARENDON NATIONAL INSURANCE CO (SUSSEX INS CO)
CLEAR SPRING PROPERTY AND CASUALTY COMPANY
COLONIAL AMERICAN CASUALTY & SURETY CO
COLONIAL SURETY COMPANY
COLUMBIA MUTUAL INSURANCE CO
COLUMBIA NATIONAL INS CO
COMMERCE AND INDUSTRY INS CO
CONSOLIDATED INS CO
CONTINENTAL CASUALTY CO
CONTINENTAL INDEMNITY CO
CONTINENTAL INS CO
CONTINENTAL WESTERN INSURANCE COMPANY
COREPOINTE INSURANCE COMPANY
CRESTBROOK INS CO
CRUM AND FORSTER INDEMNITY CO
DAKOTA TRUCK UNDERWRITERS
DEPOSITORS INS CO
DIAMOND INS CO
DISCOVER PROPERTY & CASUALTY INS CO
EASTERN ADVANTAGE ASSURANCE COMPANY
EASTERN ALLIANCE INSURANCE COMPANY
EASTGUARD INS CO
ELECTRIC INS CO
EMC PROPERTY & CASUALTY COMPANY
EMCASCO INS CO
EMPLOYERS ASSURANCE COMPANY
EMPLOYERS COMPENSATION INS CO
EMPLOYERS INS CO OF WAUSAU
EMPLOYERS INSURANCE COMPANY OF NEVADA

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NCCI Affiliate List

EMPLOYERS MUTUAL CASUALTY CO
EMPLOYERS PREFERRED INS CO
ENDURANCE AMERICAN INS CO
ENDURANCE ASSURANCE CORPORATION
EVEREST DENALI INSURANCE COMPANY
EVEREST NATIONAL INS CO
EVEREST PREMIER INSURANCE COMPANY
EVEREST REINSURANCE CO DIRECT
EXACT PROPERTY AND CASUALTY CO INC
EXECUTIVE RISK INDEMNITY INC
EXPLORER INS CO
FALLS LAKE NATIONAL INSURANCE CO
FARMERS INSURANCE EXCHANGE
FARMINGTON CASUALTY COMPANY
FCCI INSURANCE COMPANY
FEDERAL INSURANCE COMPANY
FEDERATED MUTUAL INS CO
FEDERATED RESERVE INSURANCE CO
FEDERATED RURAL ELECTRIC INS EXCHANGE
FEDERATED SERVICE INS CO
FIDELITY & DEPOSIT COMPANY OF MARYLAND
FIDELITY & GUARANTY INS UNDERWRITERS
FIDELITY & GUARANTY INSURANCE CO
FIRE INS EXCHANGE
FIREMANS FUND INSURANCE CO
FIREMENS INS CO OF WASHINGTON DC
FIRST DAKOTA INDEMNITY CO
FIRST LIBERTY INS CORP
FIRST NATIONAL INS CO OF AMERICA
FIRST NONPROFIT INS CO
FIRSTCOMP INSURANCE CO
FLORISTS MUTUAL INSURANCE CO
FOREMOST INS CO GRAND RAPIDS MICHIGAN
FOREMOST PROPERTY & CAS INS
FOREMOST SIGNATURE INS CO
FRANK WINSTON CRUM INSURANCE CO
FUEL MARKETERS INSURANCE TRUST
GENERAL CASUALTY COMPANY OF WISCONSIN
GENERAL CASUALTY INSURANCE COMPANY
GENERAL INS CO OF AMERICA
GENESIS INS CO
GRANITE STATE INSURANCE COMPANY
GRAY INSURANCE COMPANY
GREAT AMERICAN ALLIANCE INS CO
GREAT AMERICAN ASSURANCE COMPANY
GREAT AMERICAN INS CO OF NY
GREAT AMERICAN INSURANCE COMPANY
GREAT AMERICAN SPIRIT INS CO
GREAT DIVIDE INSURANCE COMPANY
GREAT MIDWEST INS CO
GREAT NORTHERN INS CO
GREAT WEST CASUALTY COMPANY
GREENWICH INS CO
GRINNELL MUTUAL REINSURANCE CO
GUIDEONE ELITE INS CO
GUIDEONE INSURANCE COMPANY
GUIDEONE SPECIALTY INSURANCE COMPANY
HANOVER AMERICAN INS CO
HANOVER INS CO
HARLEYSVILLE INSURANCE COMPANY
HARTFORD ACCIDENT AND INDEMNITY CO
HARTFORD CASUALTY INS CO
HARTFORD FIRE INSURANCE CO
HARTFORD INS CO OF IL
HARTFORD INS CO OF MIDWEST
HARTFORD INS CO OF THE SOUTHEAST
HARTFORD UNDERWRITERS INS CO
HAWKEYE-SECURITY INS CO
HDI GLOBAL INSURANCE COMPANY
HOME OWNERS INS CO
HORIZON MIDWEST CASUALTY COMPANY
ILLINOIS CASUALTY COMPANY
ILLINOIS NATIONAL INSURANCE COMPANY
IMPERIUM INSURANCE COMPANY
INCLINE CASUALTY COMPANY
INDEMNITY INS CO OF N AMERICA (INA INS) (CT GEN)
INS CO OF NORTH AMERICA
INS CO OF THE STATE PA
INS CO OF THE WEST
INTREPID INSURANCE COMPANY
KEY RISK INS CO
LACKAWANNA AMERICAN INS CO
LACKAWANNA CASUALTY CO
LACKAWANNA NATIONAL INS CO
LIBERTY INS CORP
LIBERTY INSURANCE UNDERWRITERS INC
LIBERTY MUTUAL FIRE INS CO
LIBERTY MUTUAL INS CO
LM INS CORP
MA BAY INS CO
MAG MUTUAL INS CO
MANUFACTURERS ALLIANCE INS CO
MARKEL AMERICAN INSURANCE CO
MARKEL INSURANCE CO
MCDONALDS OPERATORS RISK MGMT ASSOC OF MO
MEMIC INDEMNITY CO
MERIDIAN SECURITY INSURANCE COMPANY
MID CENTURY INS CO
MIDDLESEX INS CO
MIDSOUTH MUTUAL INSURANCE COMPANY
MIDVALE INDEMNITY COMPANY
MIDWEST BUILDERS CASUALTY MUTUAL COMPANY
MIDWEST EMPLOYERS CASUALTY CO
MIDWEST FAMILY ADVANTAGE INSURANCE CO
MIDWEST FAMILY MUTUAL INS CO
MIDWEST INS CO
MIDWESTERN INDEMNITY CO
MILBANK INSURANCE COMPANY
MILFORD CASUALTY INSURANCE CO
MITSUI SUMITOMO INS CO OF AMERICA
MITSUI SUMITOMO INS USA INC
MO EMPLOYERS MUTUAL INS CO
MO RURAL SERVICES WC INS TRUST
MO WOOD INDUSTRY INS TRUST
MONROE GUARANTY INS CO
NATIONAL AMERICAN INS CO
NATIONAL CASUALTY CO
NATIONAL FIRE INS CO OF HARTFORD
NATIONAL INTERSTATE INS CO
NATIONAL LIABILITY & FIRE INSURANCE CO

Missouri

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NCCI Affiliate List

NATIONAL SPECIALTY INS CO
NATIONAL SURETY CORP
NATIONAL TRUST INS CO
NATIONAL UNION FIRE INS CO OF PITTSBURGH PA
NATIONWIDE AGRIBUSINESS INS CO
NATIONWIDE ASSURANCE CO
NATIONWIDE GENERAL INSURANCE CO
NATIONWIDE INS CO OF AMERICA
NATIONWIDE MUTUAL FIRE INS CO
NATIONWIDE MUTUAL INS CO
NATIONWIDE PROPERTY AND CASUALTY INS CO
NETHERLANDS INSURANCE COMPANY
NEW HAMPSHIRE INSURANCE COMPANY
NEW YORK MARINE AND GENERAL INSURANCE CO
NHRMA MUTUAL INSURANCE COMPANY
NORGUARD INS CO
NORMANDY INSURANCE COMPANY
NORTH AMERICAN ELITE INSURANCE CO
NORTH AMERICAN SPECIALTY INS CO
NORTH POINTE INS CO
NORTH RIVER INS CO
NORTHSTONE INSURANCE COMPANY
NOVA CASUALTY COMPANY
NUTMEG INS CO
OAK RIVER INSURANCE COMPANY
OBI AMERICA INSURANCE COMPANY
OBI NATIONAL INSURANCE COMPANY
OH CASUALTY INS CO
OH FARMERS INS CO
OHIO SECURITY INS CO
OLD GUARD INSURANCE COMPANY
OLD REPUBLIC GENERAL INSURANCE CORPORATION
OLD REPUBLIC INS CO
OWNERS INSURANCE COMPANY
PA MANUFACTURERS ASSN INS CO
PA MANUFACTURERS INDEMNITY CO
PA NATIONAL MUTUAL CAS INS CO
PACIFIC EMPLOYERS INS CO
PACIFIC INDEMNITY CO
PATRONS MUTUAL INS CO OF CT
PEERLESS INDEMNITY INS CO
PEERLESS INSURANCE COMPANY
PENN MILLERS INS CO
PENNSYLVANIA INSURANCE COMPANY
PETROLEUM CASUALTY CO
PHARMACISTS MUTUAL INS CO
PHOENIX INS CO
PINNACLE NATIONAL INSURANCE COMPANY
PINNACLEPOINT INSURANCE COMPANY
PLAZA INSURANCE CO
PRAETORIAN INSURANCE COMPANY
PREFERRED EMPLOYERS INS CO
PREFERRED PROFESSIONAL INSURANCE COMPANY
PREMIER GROUP INS CO
PRESCIENT NATIONAL INSURANCE COMPANY
PRIVILEGE UNDERWRITERS RECIPROCAL EXCHANGE
PROPERTY AND CASUALTY INS CO OF HARTFORD
PROTECTIVE INS CO
PUBLIC SERVICE INSURANCE COMPANY
QBE INSURANCE CORPORATION
REDWOOD FIRE & CASUALTY INS CO
REGENT INSURANCE COMPANY
REPUBLIC INDEMNITY CO OF CA
REPUBLIC INDEMNITY COMPANY OF AMERICA
RIVERPORT INSURANCE COMPANY
RLI INSURANCE COMPANY
ROCKWOOD CASUALTY INS CO
RURAL TRUST INSURANCE COMPANY
SAFECO INS CO OF AMERICA
SAFETY FIRST INS CO
SAFETY NATIONAL CASUALTY CORP
SAGAMORE INSURANCE CO
SAMSUNG FIRE AND MARINE INS CO LTD USB
SCOTTSDALE INDEMNITY CO
SECURA INSURANCE COMPANY
SECURA SUPREME INS CO
SECURITY NATIONAL INS CO (AMTRUST GROUP)
SELECT INS CO
SELECTIVE INS CO OF SC
SELECTIVE INS CO OF THE SOUTHEAST
SELECTIVE INSURANCE COMPANY OF AMERICA
SELECTIVE WAY INS CO
SENTINEL INS CO
SENTRY CASUALTY CO
SENTRY INS CO
SENTRY SELECT INSURANCE COMPANY
SEQUOIA INSURANCE CO
SERVICE AMERICAN INDEMNITY COMPANY
SERVICE LLOYDS INSURANCE CO, A STOCK COMPANY
SFM MUTUAL INS CO
SIRIUS AMERICA INSURANCE COMPANY
SOMPO AMERICA FIRE & MARINE INSURANCE COMPANY
SOMPO AMERICA INSURANCE COMPANY
SOUTHERN INS CO
SPARTA INSURANCE COMPANY
ST PAUL FIRE AND MARINE INS CO
ST PAUL GUARDIAN INS CO
ST PAUL MERCURY INS CO
ST PAUL PROTECTIVE INS CO
STANDARD FIRE INSURANCE COMPANY
STAR INS CO
STARNET INSURANCE COMPANY
STARR INDEMNITY AND LIABILITY CO
STARR SPECIALTY INSURANCE COMPANY
STARSTONE NATIONAL INSURANCE COMPANY
STATE AUTO PROPERTY AND CASUALTY INS CO
STATE AUTOMOBILE MUTUAL INS CO
STATE FARM FIRE AND CASUALTY CO
STATE NATIONAL INSURANCE COMPANY
STONETRUST COMMERCIAL INS CO
STONETRUST PREMIER CASUALTY INSURANCE CO
STONEWOOD INSURANCE CO
STONINGTON INS CO
SUMMITPOINT INSURANCE COMPANY
SUNZ INSURANCE COMPANY
T H E INSURANCE COMPANY
TECHNOLOGY INSURANCE CO
THE TRAVELERS CASUALTY COMPANY
TNUS INSURANCE CO
TOKIO MARINE AMERICA INSURANCE CO

Missouri

Advisory Loss Costs and Rating Values Filing – January 1, 2022

NCCI Affiliate List

TRANS PACIFIC INS CO
TRANSGUARD INS CO OF AMERICA INC
TRANSPORTATION INS CO
TRAVELERS CASUALTY & SURETY CO OF AMERICA
TRAVELERS CASUALTY AND SURETY CO
TRAVELERS CASUALTY INS CO OF AMERICA
TRAVELERS COMMERCIAL CASUALTY CO
TRAVELERS INDEMNITY CO
TRAVELERS INDEMNITY CO OF AMERICA
TRAVELERS INDEMNITY CO OF CT
TRAVELERS INSURANCE CO
TRAVELERS PROPERTY CASUALTY CO OF AMERICA
TRI STATE INSURANCE COMPANY OF MINNESOTA
TRIANGLE INSURANCE COMPANY INC
TRIUMPHE CASUALTY COMPANY
TRUCK INSURANCE EXCHANGE
TRUMBULL INS CO
TWIN CITY FIRE INS CO
UNION INS CO OF PROVIDENCE
UNION INSURANCE COMPANY
UNITED FIRE AND CASUALTY CO
UNITED STATES FIDELITY AND GUARANTY CO
UNITED WI INS CO
UNIVERSAL UNDERWRITERS INS CO
US FIRE INS CO
UTAH BUSINESS INSURANCE COMPANY INC
UTICA MUTUAL INS CO
VALLEY FORGE INS CO
VANLINER INS CO
VANTAPRO SPECIALTY INS CO
VICTORIA FIRE & CASUALTY COMPANY
VIGILANT INS CO
WASHINGTON INTERNATIONAL INSURANCE COMPANY
WAUSAU BUSINESS INSURANCE COMPANY
WAUSAU UNDERWRITERS INSURANCE COMPANY
WCF NATIONAL INSURANCE COMPANY
WELLFLEET INSURANCE COMPANY
WELLFLEET NEW YORK INSURANCE COMPANY
WESCO INSURANCE COMPANY (AMTRUST GROUP)
WEST AMERICAN INS CO
WEST BEND MUTUAL INS CO
WESTCHESTER FIRE INSURANCE COMPANY
WESTFIELD CHAMPION INSURANCE COMPANY
WESTFIELD INS CO
WESTFIELD NATIONAL INS CO
WESTFIELD PREMIER INSURANCE COMPANY
WESTFIELD SUPERIOR INSURANCE COMPANY
WESTFIELD TOUCHSTONE INSURANCE COMPANY
WESTPORT INSURANCE CORPORATION
WILLIAMSBURG NATIONAL INS CO
WORK FIRST CASUALTY CO
XL INS CO OF NY INC
XL INSURANCE AMERICA INC
XL SPECIALTY INS CO
ZENITH INS CO
ZNAT INS CO
ZURICH AMERICAN INS CO
ZURICH AMERICAN INS CO OF IL

MISSOURI

Advisory Loss Costs and Rating Values Filing – January 1, 2022

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All NCCI employees can be contacted via e-mail using the following format:

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Missouri

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Wages (Millions)		Employment (000s)		Actual AWW		Hypoth. AWW
BLS Sector	**2019**	**2020**	**2019**	**2020**	**2019**	**2020**	**2020**
Mining; quarrying; and oil and gas extraction	$304	$310	4	4	$1,393	$1,443	
Utilities	$1,227	$1,249	12	12	$2,006	$2,054	
Construction	$8,131	$8,508	127	125	$1,234	$1,304	
Manufacturing	$17,176	$16,921	277	266	$1,192	$1,223	
Wholesale trade	$9,055	$9,240	123	120	$1,414	$1,484	
Retail trade	$9,390	$9,693	304	292	$593	$639	
Transportation and warehousing	$5,472	$5,551	105	105	$1,006	$1,021	
Information	$4,133	$3,879	48	45	$1,649	$1,663	
Finance and insurance	$11,839	$12,533	136	137	$1,674	$1,757	
Real estate and rental and leasing	$1,937	$1,982	39	37	$945	$1,025	
Professional; scientific; and technical services	$13,546	$13,861	163	161	$1,602	$1,661	
Management of companies and enterprises	$7,318	$6,955	65	62	$2,169	$2,153	
Admin. and support and waste mgmt. and remediation svcs.	$6,302	$6,379	155	143	$781	$861	
Educational services	$2,668	$2,658	63	61	$819	$841	
Health care and social assistance	$20,751	$21,297	431	419	$927	$978	
Arts; entertainment; and recreation	$1,805	$1,619	43	31	$811	$1,001	
Accommodation and food services	$5,930	$5,345	266	222	$429	$464	
Other Services	$5,027	$5,095	120	113	$807	$870	
Farms	$305	$323	96	90	$61	$69	
Fishing; hunting; etc.	$207	$233	3	3	$1,268	$1,496	
Total Private	$132,523	$133,632	2,579	2,446	$988	$1,051	$1,001

(5) = [(1) × 1,000,000] / [(3) × 1,000] / 52

(6) = [(2) × 1,000,000] / [(4) × 1,000] / 52

(7 Total) = [∑ (4) × (5)] / (4 Total)

Actual AWW growth = $1,051 / $988 − 1 — 6.3%

AWW growth due to change in sector mix = $1,001 / $988 − 1 — 1.3%

State: Missouri **Filing Company:** NCCI Inc
TOI/Sub-TOI: 16.0 Workers Compensation/16.0004 Standard WC
Product Name: Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022
Project Name/Number: /

Supporting Document Schedules

Bypassed - Item:	Actuarial Justification
Bypass Reason:	NA
Attachment(s):	
Item Status:	REVIEWED
Status Date:	11/01/2021

Bypassed - Item:	Electronic Rate Submission
Bypass Reason:	NA
Attachment(s):	
Item Status:	REVIEWED
Status Date:	11/01/2021

Bypassed - Item:	Exhibits A & B (20 CSR 500-6.950)(2)
Bypass Reason:	NA
Attachment(s):	
Item Status:	REVIEWED
Status Date:	11/01/2021

Satisfied - Item:	Filing Memorandum
Comments:	
Attachment(s):	MO 1-1-2022 Filing Cover Letter.pdf
Item Status:	REVIEWED
Status Date:	11/01/2021

Satisfied - Item:	Filing Narrative
Comments:	
Attachment(s):	MO 1-1-2022 Rate Filing Narrative.pdf
Item Status:	REVIEWED
Status Date:	11/01/2021

Satisfied - Item:	Interrogatory Response
Comments:	
Attachment(s):	NCCI_Responses_to_the_Missouri_DCI_Requests_dated_090121.pdf NCCI_Responses_to_the_Missouri_DCI_Requests_dated_090121_Attachments.zip
Item Status:	REVIEWED

SERFF Tracking #:	*NCCI-132953901*	***State Tracking #:***	*411*	***Company Tracking #:***	*MISSOURI LC 01012022*

State:	*Missouri*	***Filing Company:***	*NCCI Inc*
TOI/Sub-TOI:	*16.0 Workers Compensation/16.0004 Standard WC*		
Product Name:	*Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022*		
Project Name/Number:	*/*		

Status Date:	11/01/2021

Satisfied - Item:	Interrogatory Response 9/24/2021
Comments:	
Attachment(s):	CW20191001.pdf Excess Loss Factor Calculations.pdf MO ELF 2022-1-1.xls NCCI_Responses_to_the_Missouri_DCI_Requests_dated_092421.pdf Exhibit 1.pdf Exhibit 2.xlsx
Item Status:	REVIEWED
Status Date:	11/01/2021

SERFF Tracking #:	NCCI-132953901	**State Tracking #:**	411	**Company Tracking #:**	MISSOURI LC 01012022

State:	Missouri	**Filing Company:**	NCCI Inc
TOI/Sub-TOI:	16.0 Workers Compensation/16.0004 Standard WC		
Product Name:	Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022		
Project Name/Number:	/		

Attachment NCCI_Responses_to_the_Missouri_DCI_Requests_dated_090121_Attachments.zip is not a PDF document and cannot be reproduced here.

Attachment MO ELF 2022-1-1.xls is not a PDF document and cannot be reproduced here.

Attachment Exhibit 2.xlsx is not a PDF document and cannot be reproduced here.

Carla Townsend, WCP
Regulatory Division

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Email: Carla_Townsend@ncci.com

August 23, 2021

The Honorable Chlora Lindley-Myers
Director
Missouri Department of Commerce and Insurance
Harry S Truman State Office Building
301 W. High St., Room 530
Jefferson City, Missouri 65101

Re: Missouri Advisory Loss Costs and Rating Values Filing Proposed Effective January 1, 2022

Dear Director Lindley-Myers:

In accordance with the applicable statutes and regulations of the state of Missouri, we are filing advisory voluntary loss costs and rating values to be effective January 1, 2022 for new and renewal policies.

Enclosed are NCCI's Voluntary Loss Costs Including Trend proposed to be effective January 1, 2022. The proposed loss costs represent an overall average change of -7.7% from the current, similar set of loss costs that have been in effect since January 1, 2021.

Reported COVID-19-related claims have been excluded from the data on which this filing is based because those claims are not expected to be predictive of the loss experience that may arise during the filing prospective period. After an in-depth review and analysis, NCCI has determined that its standard ratemaking methodologies continue to remain appropriate for use in this year's filing.

I hereby certify that I am familiar with Missouri's insurance laws, rules, and regulations, and to the best of my knowledge, information, and belief, this filing complies in all respects to such laws, rules, and regulations. This filing is made on behalf of the members and subscribers of the National Council on Compensation Insurance, Inc., who are writing or will write workers compensation insurance in Missouri.

This filing is made exclusively on behalf of the companies that have given valid consideration for the express purpose of fulfilling regulatory rate or pure premium filing requirements and other private use of this information.

In the enclosed is a list of companies, which as of the time this filing is submitted, are eligible to reference this information. The inclusion of a company on this list merely indicates that the company, or the group to which it belongs, is affiliated with NCCI in this state, or has licensed this

information as a non-affiliate, and is not intended to indicate whether the company is currently writing business or is even licensed to write business in this state.

Please contact me if you have any questions or need further information.

Sincerely,

National Council on Compensation Insurance, Inc.

Carla Townsend, WCP
State Relations Executive

Overview of the Proposed Missouri Workers Compensation Loss Cost Filing Effective January 1, 2022

I. Summary of Filing

The purpose of this overview is to provide context and an explanation for the accompanying proposed workers compensation insurance loss cost filing that was filed under separate cover by the National Council on Compensation Insurance (NCCI) on August 23, 2021 with the Missouri Department of Commerce and Insurance for its review and approval. NCCI is a licensed advisory organization authorized to make recommended loss cost[1] filings on behalf of workers compensation insurance companies in Missouri. NCCI's filing is objectively prepared, in compliance with actuarial standards.

NCCI's filing proposes a -7.7% loss cost decrease in the voluntary market, effective January 1, 2022. In addition, as more fully explained below, NCCI's corresponding item filing proposes to implement a new catastrophe provision in Missouri.

The current filing is based on premium and losses for Policy Years 2018 and 2019 (the "Experience Period"). The financial data evaluated as of December 31, 2020 indicates improved experience when compared with the loss and premium data evaluated as of December 31, 2019. Missouri's lost-time claim frequency continues to show a long-term pattern of decline. The average indemnity cost per lost-time claim has increased modestly in recent years compared to wage growth. The average medical cost per lost-time claim has exhibited a long-term increasing pattern, although the decrease observed in Policy Year 2019 is contrary to that trend.

II. Overview of Ratemaking Methodology

NCCI's approach to determining the proposed overall average loss cost level change in the filing utilizes widely accepted actuarial ratemaking methodologies. The approach employed includes the following steps:

- Premium and losses are adjusted to the currently approved loss cost and benefit levels (both medical and indemnity)
- These adjusted losses and premium are projected to their ultimate value and are used to calculate a loss ratio (loss ratio = losses/premium) for each year included in the experience period, which ranges from a two to a five-year period, depending on the state

[1] Loss cost refers to the portion of workers compensation rates filed by the advisory organization that are allocated to pay losses and not for carrier expenses. Some states include certain carrier expenses and assessments in the definition of advisory loss costs. Carriers can use the approved loss costs as the basis for their rates, typically adjusting them for expenses with a loss cost multiplier.

- Loss ratios, along with other information, are analyzed to produce trend factors used to help project future results
- The trend factors are applied to the known loss ratios of past years in the experience period to forecast future increases or decreases and the degree of those projected future changes
- As a final step, any benefit and/or expense changes are applied to the loss ratios
- The result is the new loss ratio proposed in this filing

If the final projected loss ratio is greater than 1.000, then an increase in the average loss cost level is indicated; a projected loss ratio of less than 1.000 indicates a decrease.

Once the proposed voluntary loss cost level change is determined, NCCI separately determines and updates loss costs for *each* workers compensation classification code (class code); the loss costs and year-over-year changes vary by class code and are based on data collected for each class code.

III. COVID-19

NCCI's last annual loss cost filing did not include COVID-19 claim data; nor did it include explicit adjustments for the potential impact of a pandemic. The current filing also does not include an explicit adjustment. After extensive analysis of how to best reflect pandemics in future loss cost filings, NCCI determined that a catastrophe provision is the most appropriate way to reflect exposure to future pandemics. Consequently, a separate NCCI item filing was made that proposes a Catastrophe (other than Certified Acts of Terrorism) provision, for any single event or peril resulting in aggregate WC losses in excess of $50 million (which may include pandemics). This item filing is This item filing is currently pending.

IV. CONCLUSION

The workers compensation system continues to experience unprecedented results. The 2020 private carrier combined ratio marks the fourth consecutive year of results under 90% (below 100% is indicative of an underwriting profit), seven consecutive years under 100%, thus, the seventh consecutive year of underwriting gains. These results are due to a combination of underwriting discipline, declining frequency, moderating severity, and adequate reserves. With few annual exceptions, frequency has continued a decades long downward course driven by technology, safer workplaces, improved risk management, and a long-term shift from manufacturing to service sectors. 2020 data and preliminary 2021 data show frequency also dropped because of indirect effects of the pandemic. NCCI has no expectation that the long-term downward trend in frequency will change. For the last several years, severity trends have remained fairly moderate, tracking very closely with wage inflation. For these reasons, NCCI's analysis has continued to indicate decreases across many of its jurisdictions in recent years. NCCI will continue to monitor and analyze the impact of COVID-19 on the workers compensation system and publish our research and findings in the ***Insights*** portal on ncci.com as it becomes available.

NATIONAL COUNCIL ON COMPENSATION INSURANCE, INC.

MISSOURI ADVISORY LOSS COSTS AND RATING VALUES FILING—JANUARY 1, 2022

RESPONSES TO THE DEPARTMENT OF COMMERCE AND INSURANCE'S REQUESTS DATED SEPTEMBER 1, 2021

1. **Have any of the data sources used in determining the Missouri Advisory Loss Costs and Rating Values Filing changed since the previous filing? For example, using data from a different data call to develop expenses.**

   There have not been any changes in the underlying data sources between this and last year's filings.

2. **Please provide the estimated overall impact for each change in methodology from the previous filing.**

   The methodology changes contained in this year's filing are as follows:

   - Federal-Classification (F-Class) Ratemaking: This change proposes to revise the current approach used to determine the loss costs for those classification codes that are subject to the benefits provided under the United States Longshore and Harbor Workers Compensation Act. The change in methodology has resulted in an overall average loss cost/rate level decline across all jurisdictions for which NCCI provides ratemaking services.

   - Calendar Year 2020 Wage Adjustment: No filed aggregate or class ratemaking parameters were affected by the wage adjustment—including the filed loss ratio trend factors. Note: Even though the wage adjustment slightly impacted the frequency and severity values displayed in the filing's Appendix A-III (as those values are adjusted to a common wage level), those values were not used as the basis for the selected loss ratio trend factors included in the filing.

3. **Please provide support for the selected catastrophe provision (other than Certified Acts of Terrorism) of $0.01 per $100 of payroll in Missouri.**

   Please see the attached copy of Missouri Item Filing 02-MO-2021 (*Rules and an Endorsement Related to the Catastrophe (Other than Certified Acts of Terrorism) Provision in Missouri*) for additional supporting information. The proposed provision recognizes that there are multiple potentially catastrophic perils with exposure on workers compensation system costs.

4. **How many COVID-19-related claims were removed from reported loss data in Missouri and Countrywide, and what was the total cost of these claims in Missouri and Countrywide?**

   The following slide provides aggregate countrywide totals as of year-end 2020 for those jurisdictions where NCCI provides ratemaking services:
   https://www.ncci.com/SecureDocuments/SOLGuide2021.html#covid-19_losses

   In Missouri, a total of 140 COVID-19-related lost-time claims and approximately $1.65M case-incurred losses were removed from Policy Year (PY) 2019.

5. **How was the 2020 average weekly wage adjusted to exclude the estimated impact of pandemic-related industry-sector mix change? How was it determined what industry-sector mix changes were expected to return to pre-pandemic levels over time and what changes were expected to persist?**

   The nationwide impact of shifts in the average weekly wage (AWW) due to the mix of employment across economic sectors was notably higher in CY 2020 (+1.6% countrywide) than in previous years (+/- 0.2%). This change in the AWW due to mix of employment across economic sectors was almost entirely due to large job losses in the leisure and hospitality sector. For frequency purposes, as the AWW change should be approximating average wage growth for workers within a class, the CY 2020 AWW was restated to remove the impact of the shift in mix of employment across sectors. The mix impact was estimated by comparing a hypothetical AWW using CY 2019 AWW by sector with the 2020 employment mix by sector to the actual CY 2019 AWW. This adjustment is intended to remove distortion in the change in frequency between Policy Years 2018 and 2019.

6. **Was it assumed in this analysis that 2022 will mark a return to pre-COVID-19 loss and wage levels, or was there consideration given to the impact of the Delta variant or other variants on claims and economic conditions in 2022?**

   While no assumption was specifically made that 2022 will return to pre-COVID-19 levels, recognition of the pandemic's direct and indirect impacts on PY2019 were considered when selecting the filing's experience period as well as during this year's trend analysis. Please see the response to Request 15 for additional detail.

7. Please provide loss development triangles with at least 10 diagonals for both the voluntary and assigned risk markets separated by indemnity, medical, and DCCE for the past 19 years. In the prior year, this was submitted as Exhibit 4 Development Triangles.xlsx. An updated version of this file will suffice for these purposes.

Please see the attached Exhibit 7 for the available loss development triangles.

8. Please provide an Excel file with the specific calculations used to determine Appendix A-II, Section G, column (6) for the most recent year.

Please see the attached Exhibit 8 for the requested information. The calculations are provided for the most recent two valuations separately for indemnity and medical.

9. Please provide an excel file spreadsheet with the specific calculations that provide the derivation of the 0.778 factor in Appendix A-II, Section H, line 2.

Please see the attached Exhibit 9 for the requested information.

10. Exhibit II Sections A and B Page 46 of 97:

a) Please provide the underlying data and calculations to bring AOE and DCCE to an ultimate level including the development factors, AOE, DCCE, losses, and any other values used to determine the Ultimate AOE and DCCE ratios.
b) Please provide the Ultimate AOE Ratios for MO only data.
c) In the prior years filing, the AOE provision from MO was selected based on a countrywide and MO specific analysis. Was this process still used in this filing?

Please see Exhibits 10a, 10b, and 10c for the requested information.

The Missouri selected AOE provision is based on a weighted average of the countrywide private carrier AOE provision and the indicated provision for Missouri Employers Mutual.

11. Appendix A-I Section A and Section D Pages 48 and 49 of 97: Please provide the underlying data and calculations to support the factors in column (6).

The expense removal factor removes the current LAE provision of 19.3% to adjust reported premium to a pure premium level.

$$0.838 = (1 / 1.193)$$

12. Appendix A-I Section A and Section D Pages 48 and 49 of 97: Please provide the underlying data and calculations to support the factors in column (7). More specifically, how is the targeted off-balance factor of 0.952 determined?

The premium used in the statewide rate level indication is standard premium, which includes the impact of experience rating. The off-balance adjustment factor adjusts the premium in historical policy years to account for the difference between the observed off-balance for each of those years and the targeted off-balance.

The targeted off-balance factor (0.952) is a weighted average of the targeted intrastate experience rating modification factor (e-mod) and the current estimate of the average interstate e-mod, adjusted for risks that are not subject to experience rating. The targeted intrastate e-mod in this year's filing is 0.960, and the average interstate e-mod is 0.927. Using 53.4% as the intrastate percentage of experience rated risks, the combined weighted average e-mod factor is 0.945. The final targeted off-balance is calculated by multiplying 0.945 by the percentage of risks that are experience rated (87.4%) and then adding to that the percentage of risks not experience rated multiplied by unity. The calculation is as follows:

$$0.952 = 0.945 \times 0.874 + (1.000 - 0.874) \times 1.000$$

The off-balance factor for each policy year is calculated in a similar manner, instead using the historical factors calculated from the experience rating values in place at that time. The table below summarizes the calculation for policy years 2018 and 2019.

	2018	**2019**
(1) Average intrastate e-mod	0.956	0.962
(2) Average interstate e-mod	0.950	0.948

(3) Intrastate %	53.6%	53.4%
(4) Combined average e-mod = (1)x(3)+(2)x[1-(3)]	0.953	0.955
(5) Rated %	88.4%	87.9%
(6) Off-Balance = (4)x(5)+[1-(5)]	0.958	0.960

The off-balance adjustment factor results from the ratio of the Targeted Off-Balance to the Off-Balance for the corresponding policy year.

	2018	**2019**
(1) Targeted Off-Balance	0.952	0.952
(2) Policy Year Off-Balance	0.958	0.960
(3) Off-Balance Adjustment Factor = (1)/(2)	0.994	0.992

13. Appendix A-IV Section I Page 63 of 97: Please show the calculations underlying the factors in Col (4) and Col (5).

Column (4) shows the current manual premium to standard premium ratios that were calculated using the latest five years of WCSP data underlying the 1/1/2021 Missouri filing. Column (5) shows the proposed manual premium to standard premium ratios calculated using the latest five years of WCSP data underlying the 1/1/2022 Missouri filing. Standard premium is calculated as the reported manual premium multiplied by the reported experience modification factor. Please see Exhibit 13 for the calculation of these factors.

14. Appendix B-I Section I Page 66 of 97: Please provide underlying data and calculations for how the Likely-to-Develop and Not-Likely-to-Develop columns are calculated.

Please see the attached Exhibit 14 for the requested information.

15. Page 62 of 97 (Appendix A-III). Provide the underlying data, fits, assumptions, calculations, selections and rationale of the selection of the indemnity and medical trend factors. Please include an update of the excel file provided last year entitled Exhibit 14 Supplemental Loss Development and Trend. Please include fifteen years of information including Lost-Time claim frequency and severity based on data in excess

of wage inflation, claim counts, premium, limited indemnity losses, and limited medical losses.

Please see the attached Exhibit 15 for the requested trend information.

Supporting the proposed loss ratio trend factors in this year's filing is an underlying continuation of the long-term decline in lost-time claim frequency, relatively consistent year-over-year indemnity claim severity changes, and a generally increasing pattern of medical lost-time claim severities.

Consideration of the trend component in this year's filing included a review of loss ratio patterns observed over an extended period of time. This allows one to review trends over an entire underwriting cycle and smooth out year-to-year fluctuations. The proposed annual loss ratio trend factors utilized in this year's filing were selected based on actuarial judgment and considered the uncertainty related to the COVID-19 pandemic. Results of exponential trends fit to a varying number of policy year loss ratios are provided below.

Policy Year Loss Ratio Exponential Trend Fits

	Indemnity	Medical
8-point	-2.9%	-1.6%
10-point	-2.8%	-2.2%
12-point	-2.3%	-1.6%
15-point	-2.1%	-1.2%

16. Appendix B-IV Part 1 Section A.2, Page 77 of 97: Why are the current annual trends of 0.980 and 0.990 for indemnity and medical, respectively, used to trend losses rather than the selected trends of 0.975 and 0.985?

Each state's experience is adjusted to a common countrywide level and aggregated to determine a countrywide pure premium. The countrywide pure premium is prepared prior to the preparation of each state's proposed experience filing. As such, current annual trends for each state are used to bring the losses of each state from the midpoint of each policy year to 1/1/2022. The proposed trends 0.975 and 0.985 are then used to bring Missouri's base pure premium from the 1/1/2022 date to the midpoint of the proposed period.

17. Appendix B-IV Part I Section C Page 79 of 97: Please provide the underlying data, assumptions, and calculations used to determine Missouris index to Countrywide factor of .684. Please provide the data and calculations described on steps 1 to 5 for Missouri.

		Hazard Group	(a) F-class Countrywide Payroll Distribution	(b) Missouri's Average Pure Premium
(1)		E	13.5%	1.21
(2)		F	11.7%	3.94
(3)		G	74.8%	4.19
(4)	Missouri Average Pure Premium = (1a) x (1b) + (2a) x (2b) + (3a) x (3b)			3.76
(5)	Countrywide Average Pure Premium			2.57
(6)	Missouri Index to Countrywide Factor = (5) / (4)			0.684

Missouri's index to countrywide factor of 0.684 is a ratio of the countrywide average pure premium to Missouri's average pure premium. Missouri's average pure premium is calculated using the industrial loss costs from Hazard Groups E, F, and G, payroll by class code, and loss-based expenses from the latest approved filing. The industrial average pure premiums from hazard groups E, F, and G are used since F-class codes are in these hazard groups. The loss-based expenses are removed from the loss costs and weighted with the payroll by class code to calculate the average pure premium for each hazard group. The average pure premiums by hazard groups (Column B) are then weighted by the F-class countrywide payroll distribution of Hazard Groups E, F, and G (Column A) to calculate a Missouri average pure premium. An average pure premium is calculated for each state in a similar manner using values from its latest approved filing. To calculate the countrywide average pure premium, each state's average pure premium is weighted by its respective F-class payroll. Missouri's F-class payroll of $348,102,767 gives Missouri a weight of 3.8% in the calculation of the countrywide average pure premium.

18. Appendix B-IV Part I Section D Page 79 of 97: Please provide the underlying data, assumptions, and calculations used to determine the 10-Year Expected Unlimited Countrywide Losses in Col (2).

For each state, federal and state act losses are reported separately. Each state's experience is adjusted using primary conversion factors and excess ratios to calculate expected unlimited losses; the Missouri specific factors can be found in Appendix B-IV Part I. While the federal losses are at a countrywide level as they are based on a national benefit structure, the individual state act losses need to be adjusted to a countrywide basis before combining with federal act losses to calculate final converted losses. The final converted losses for Missouri and all other NCCI states are then aggregated by class. Exhibit 18 includes the Missouri limited loss data for both state act and federal losses as well as the final converted losses for Missouri.

19. Appendix B-IV Part I Section D Page 79 of 97: Regarding Col (4), what is considered a limited amount of data that would equate to a class code having their relativity set to 1.000 per the footnote?

The class codes with their relativity set to 1.000 were selected based on actuarial judgment. Even on a countrywide basis these codes are subject to large swings where a single loss could have a significant impact on the calculated pure premium for these codes due to the limited amount of experience. Note that for the five codes where a relativity of unity was selected (6801, 6828, 6829, 6873, 9077) only code 9077 exists in Missouri. Code 9077 has no payroll in the latest policy year in Missouri, therefore the 1.000 relativity selection for 9077 is estimated to have no impact on Missouri F-Class premium.

20. Appendix B-IV Part II Section A.1 Page 80 of 97: Please provide the underlying data and calculations for the State Act Pure Premium Relativity Factor of 1.462.

State Act Pure Premium Relativity Factor = 1 / Missouri's index to countrywide factor*
= 1 / 0.684
= 1.462

*See the response to Question 17 for the derivation of Missouri's index to countrywide factor.

21. Appendix B-IV Part II Section B.4. Page 80 of 97: Please provide the underlying data and calculations for the Federal Act Loss-Based Assessment of 1.115.

The derivation of the Federal Act Loss-Based Assessment may be found in the Appendix C-I, Page 89 of 97, of the loss cost filing.

22. Appendix B-IV Section B Page 78 of 97: Please provide the underlying data and calculations to support the Excess Ratios in Row (1).

Please see the attached Exhibit 22 for the underlying data and calculations to support the Countrywide Excess Ratios. These values use the countrywide aggregated data underlying the R-1419 Item Filing.

23. Why were relativities for class codes with limited data set to 1.000 rather than credibility weighting or similar?

Due to the limited amount of experience available for these codes at even the national level, the overall F-Class loss cost for the state is more appropriate than the relativity indicated based on the class code's experience. See "Response 19" for further details regarding the impact of the 1.000 relativity selection.

24. Appendix B-IV Section 3 Page 78 of 97: Please explain why the losses developed to an ultimate basis using loss development factors based on country wide data excludes data from Texas.

The loss development factors used to develop the F-class losses to an ultimate basis exclude Texas because the majority of Texas Workers Compensation Statistical Plan experience is not available on a likely/not-likely basis.

25. Why do the Policy Periods found in Appendix B-IV only go up to Policy Year 2017 and not Policy Year 2019 like the other Policy.

The proposed F-Class methodology uses countrywide information for increased stability. In order to use countrywide experience, the F-Class analysis relies on the latest

approved data for all states from the prior filing season. As a result, the policy years used for the F-Class analysis do not match those used for the industrial analysis.

26. Please provide the indication as of 1/1/2022 if all assigned risk experience was excluded. Please provide these calculations in an excel file and include all the underlying components that will change because they are based on only voluntary experience, such as loss development, trend, LAE, etc.

All else equal, an overall average loss cost level indication of −8.8% results after excluding the assigned risk premium and loss experience reported to NCCI by Missouri's designated assigned risk plan administrator from the filing's experience period. Please see the attached Exhibit 26 for additional detail.

27. Please provide any updates on class ratemaking research, status and results, or stability performance results on tests of the performance of the recently implemented small class ratemaking project intended to address the stability of the small classes.

There have been no research or performance testing updates for small class ratemaking in the past year. Please refer to the exhibits provided in response to Objection 17 of last year's filing for the latest available information.

28. Please provide an Excel file with seven columns of information. The first column should be the class code, the second column should be the exposures by class code, the third column should be the current advisory loss cost, the fourth column should be the proposed advisory loss cost by class code and the last three columns should be the percentage loss cost changes effective 2022, 2021, and 2020 by class code. Include totals in columns 4, 5 and 6 and please exclude discontinued classes. This file was submitted as Exhibit 18 Loss Cost Comparison.xlsx in last years filing.

Please see the attached Exhibit 28 for the requested information. The exposure reflects the most recent policy period used in the Missouri 1/1/2022 filing. The prior year changes exclude class codes that are discontinued as of 1/1/2022.

29. Please confirm that the indication provided in Exhibit I is an indication for the voluntary market but that the data upon which it is based is on combined voluntary and assigned risk plan losses. If not, please explain. Please confirm that although the voluntary indications are based on combined voluntary and assigned risk plan data, that you are not providing loss costs or rates for the assigned risk market

The voluntary market advisory loss cost level indication determined in the filing's Exhibit I is based on combined voluntary and assigned risk premium and loss experience reported to NCCI. NCCI's role in Missouri does not include the filing of loss costs or rates for the state's assigned risk market.

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ITEM 02-MO-2021—RULES AND AN ENDORSEMENT RELATED TO THE CATASTROPHE (OTHER THAN CERTIFIED ACTS OF TERRORISM) PROVISION IN MISSOURI

PURPOSE

This item revises and establishes rules and an endorsement related to the Catastrophe (other than Certified Acts of Terrorism) Provision in Missouri. The following NCCI manuals are impacted:

- ***Basic Manual for Workers Compensation and Employers Liability Insurance (Basic Manual)***
- ***Statistical Plan for Workers Compensation and Employers Liability Insurance (Statistical Plan)***
- ***Forms Manual of Workers Compensation and Employers Liability Insurance (Forms Manual)***

BACKGROUND

NCCI currently categorizes catastrophic events as earthquakes, noncertified acts of terrorism, or catastrophic industrial accidents that results in aggregate workers compensation losses in excess of $50 million. Under NCCI's actuarial catastrophe methodology, data from catastrophes is excluded in the calculation of loss costs/rates because these events are not considered to be predictive of future experience. NCCI's Catastrophe (other than Certified Acts of Terrorism) Provision is used to contemplate exposure to catastrophic occurrences.

Both the definition of catastrophe and the treatment of catastrophe losses in property and casualty ratemaking are addressed in the Actuarial Standards of Practice (ASOP). As defined in ASOP 39, Treatment of Catastrophe Losses in Property/Casualty Insurance Ratemaking, a catastrophe is "a relatively infrequent event or phenomenon that produces unusually large aggregate losses." ASOP 39 also states that "consideration should be given to the impact of catastrophes and that procedures should be developed to include an allowance for catastrophe exposure in the rate."

The exposure to catastrophic workers compensation losses exists in Missouri. In 2004, NCCI filed a similar provision in Missouri—Item B-1393—Miscellaneous Values for Domestic Terrorism, Earthquakes, and Catastrophic Industrial Accidents to address certain catastrophic occurrences; this item was withdrawn in Missouri. Since there is not currently a provision to account for any events that may result in aggregate workers compensation losses in excess of $50 million, the current loss cost structure in Missouri does not sufficiently account for these risks. The COVID-19 pandemic is the most recent catastrophic event impacting the workers compensation system. NCCI estimates that COVID-19 pandemic claims, excluding self-insureds, have the potential to ultimately result in workers compensation losses exceeding $500 million over the entire duration of the pandemic across jurisdictions where NCCI provides ratemaking services.

NCCI is proposing to implement NCCI's actuarial catastrophe methodology in Missouri. This methodology would treat a single event or peril that results in aggregate workers compensation losses in excess of $50 million per occurrence as a catastrophe and thus exclude reported data from such an event from ratemaking. It would also establish the Catastrophe (other than Certified Acts of Terrorism) Provision in Missouri, which includes a ***Basic Manual*** rule, endorsement, statistical code, and miscellaneous value, consistent with other NCCI states. The Catastrophe (Other Than Certified Acts of Terrorism) Premium Endorsement defines "Catastrophe (Other Than Certified Acts of Terrorism)" as "A single event or peril resulting in a group of claims with aggregate workers compensation losses in excess of $50 million. This $50 million threshold applies per occurrence, across all states for which claims arise from a single event or peril." In

adherence with the ASOPs, this treatment recognizes that there are multiple potentially catastrophic perils with exposure on workers compensation system costs.

Since pandemics have not previously been contemplated as a catastrophic event and the COVID-19 pandemic resulted in losses in excess of $50 million, NCCI recently consulted with an expert catastrophe loss modeling firm to model the impact of pandemics on workers compensation system costs. No other perils were recently modeled but should still be contemplated as possible catastrophic events with exposure to workers compensation system costs.

Pandemic Modeling

The COVID-19 pandemic has shown that pandemics have the potential to be a catastrophic peril on workers compensation system costs. To understand the risk that future pandemics could have on workers compensation system costs beyond COVID-19, NCCI recently engaged with AIR Worldwide (AIR), an expert catastrophe loss modeling firm and subsidiary of Verisk Analytics. After an extended joint project with AIR, NCCI has concluded that:

- Pandemics may have a significant impact on the workers compensation system.
- The expected average annual pandemic loss is not directly quantifiable for workers compensation insurance exposure.
- It is appropriate to define Catastrophe (other than Certified Acts of Terrorism) as a single event or peril resulting in a group of claims with aggregate workers compensation losses in excess of $50 million. This $50 million threshold applies per occurrence, across all states for which claims arise from a single event or peril.

AIR uses a global catastrophe pandemic model to assess the potential impact of pandemics. This model considers a collection of risk parameters including, but not limited to, pathogen type; start location; transmission rate; virulence; local, national, and international response mechanisms; time of year; and travel patterns. The included pathogens are influenza, coronaviruses, filoviruses, cholera, Rift Valley fever, Crimean-Congo hemorrhagic fever, bubonic plague, Lassa fever, and bacterial meningitis. Using employees as the unit of exposure, the model estimates the probability of a physician visit, hospitalization, or death, along with the associated costs.

In accordance with ASOP 38, Using Models Outside the Actuary's Area of Expertise (Property and Casualty), NCCI reviewed the appropriateness of the pandemic model for its intended use. AIR's model produced estimates of the average medical losses per worker resulting from pandemics, regardless of whether the claim originated from the workplace or was otherwise compensable. To focus AIR's model framework on workers compensation, NCCI applied several adjustments to the AIR-provided values: (1) converted the estimates to account for lifetime medical costs, (2) added expected indemnity losses, (3) applied a factor for compensability, and (4) limited all events to $100 billion to account for insurer insolvency and to recognize preventative measures that could be taken at more severe event levels.

NCCI discovered a number of challenges in quantifying the impact of pandemics on workers compensation system costs:

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- Uncertainty in quantifying the share of pandemic illnesses that were transmitted at work or are otherwise compensable
- Uncertainty of how occupation exposure risk could vary depending on the severity of the pandemic
- Uncertainty in human behavior by state that could impact the transmissibility of a future pandemic
- Possible inverse correlation of pandemic losses with nonpandemic losses

NCCI converted the estimated countrywide loss amount per worker from the pandemic loss modeling firm to a loss cost per $100 of payroll using an NCCI-weighted state average weekly wage and the approved January 1, 2021 Missouri voluntary loss-based expense provision. NCCI relied on average weekly wage information from the Bureau of Labor Statistics' Quarterly Census of Employment and Wages to calculate an indicated pandemic loss cost. The indicated pandemic loss cost in Missouri is $0.019.

NCCI selected an overall Catastrophe (other than Certified Acts of Terrorism) Provision to consider all catastrophic events or perils resulting in aggregate workers compensation losses in excess of $50 million per occurrence. This provision contemplates exposure to any single event or peril, which may include pandemics.

PROPOSAL

To reflect the newly established Catastrophe (other than Certified Acts of Terrorism) Provision in Missouri, this item proposes to:

1. Revise the rule, Catastrophe provisions, in NCCI's ***Basic Manual*** to include Catastrophe (other than Certified Acts of Terrorism)
2. Revise the Missouri Workers Compensation Premium Algorithm in NCCI's ***Basic Manual***
3. Establish the Missouri Miscellaneous Value advisory loss cost for Catastrophe (other than Certified Acts of Terrorism) in NCCI's ***Basic Manual***

   NCCI is proposing a Miscellaneous Value advisory loss cost for Catastrophe (other than Certified Acts of Terrorism) to apply to Missouri payroll, to account for a single event or peril resulting in a group of claims with aggregate workers compensation losses in excess of $50 million. This $50 million threshold applies per occurrence, across all states for which claims arise from a single event or peril.

   The proposed Catastrophe (other than Certified Acts of Terrorism) advisory loss cost per $100 of payroll in Missouri is $0.01. Each insurance company offering voluntary workers compensation insurance may choose to incorporate the Catastrophe (other than Certified Acts of Terrorism) Provision in its premium calculation. This premium charge would not be used by NCCI in ratemaking or experience rating.
   Note: The advisory loss cost catastrophe provision in the Miscellaneous Values is not a final rate, as it does not include provisions for all expense-related components.

   The calculation of the voluntary loss cost is detailed in the Informational Exhibit.

   In accordance with NCCI's Catastrophe Methodology, NCCI would exclude from ratemaking all reported claims resulting from a single event or peril that results in a group of claims with aggregate workers compensation losses in excess of $50 million per occurrence, across all states for which claims arise from a single event or peril.

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ITEM 02-MO-2021—RULES AND AN ENDORSEMENT RELATED TO THE CATASTROPHE (OTHER THAN CERTIFIED ACTS OF TERRORISM) PROVISION IN MISSOURI

4. Establish Statistical Code 9741—Catastrophe Provisions for Catastrophe (Other Than Certified Acts of Terrorism) in NCCI's ***Statistical Plan*** for use in Missouri
5. Establish the Catastrophe (Other Than Certified Acts of Terrorism) Premium Endorsement (WC 00 04 21 F) in NCCI's ***Forms Manual***
6. Establish the Catastrophe (other than Certified Acts of Terrorism) Voluntary Loss Cost Calculation for use in Missouri

IMPACT

Catastrophic data would be excluded in the calculation of loss costs.

Carriers charging the Catastrophe (other than Certified Acts of Terrorism) advisory loss cost of $0.01 per $100 of payroll would collect additional premium to account for exposure to catastrophic risks.

EXHIBIT COMMENTS AND IMPLEMENTATION SUMMARY

Exhibit	Exhibit Comments	Implementation Summary
1	Details the revision to the rule, Catastrophe provisions, in NCCI's ***Basic Manual***.	To become effective for new and renewal policies with effective dates on and after 12:01 a.m. on August 1, 2022.*
2	Details the revisions to the Missouri Workers Compensation Premium Algorithm in NCCI's ***Basic Manual***.	
3	Details the establishment of the Missouri Miscellaneous Value advisory loss cost for Catastrophe (other than Certified Acts of Terrorism) in NCCI's ***Basic Manual***.	
4	Details the establishment of Statistical Code 9741 in NCCI's ***Statistical Plan*** for use in Missouri.	
5	Details the establishment of the Catastrophe (Other Than Certified Acts of Terrorism) Premium Endorsement (WC 00 04 21 F) in NCCI's ***Forms Manual***.	
Informational Exhibit	Details the Catastrophe (other than Certified Acts of Terrorism) Voluntary Loss Cost Calculation.	

*This lead time will provide insurance companies with ample time to incorporate the rule revisions and the new endorsement into their processes.

EXHIBIT 1

Item 02-MO-2021— Rules and an Endorsement Related to the Catastrophe (Other Than Certified Acts of Terrorism) Provision in Missouri

Catastrophe provisions

Rule ID: BM-PARC-C499F

Effective Date: August 1, 2022

Catastrophe provisions of the policy are (a) ~~Terrorism, and~~ Catastrophe (other than Certified Acts of Terrorism), (~~a~~ b) Terrorism, and (~~b~~ c) Terrorism Risk Insurance Act (TRIA) of 2002 and any amendments thereto enacted by Congress.

Premium for Catastrophe (other than Certified Acts of Terrorism)

Premium for Catastrophe (other than Certified Acts of Terrorism) is calculated on the basis of total payroll according to Rules for calculating premium and Payroll rules. Premium is calculated by dividing an employer's total payroll in each state by units of $100 and multiplying that by the appropriate value, found in the miscellaneous values. The calculation is expressed as

Payroll/100 x Catastrophe (other than Certified Acts of Terrorism) Value = Premium.

This premium is applied after the standard premium and is not subject to any other modifications including, but not limited to

- premium discount
- experience rating
- schedule rating, or
- retrospective rating.

A policy issued on an "if any" basis is not charged this premium unless such policy develops premium during the policy term or at audit.

Per capita classifications are not subject to this premium charge.

Premium for Terrorism

Premium for Terrorism is calculated on the basis of total payroll according to the Rules for premium basis and payroll allocation. Premium is calculated by dividing an employer's total payroll in each state by units of $100 and multiplying that by the appropriate value found in the miscellaneous values. The calculation is expressed as

Payroll/100 x Terrorism Value = Premium.

This premium is applied after standard premium and is not subject to any other modifications including, but not limited to

- premium discount
- experience rating
- schedule rating, or
- retrospective rating.

A policy issued on an "if any" basis is not charged this premium unless such policy develops premium during the policy term or at audit.

Per capita classifications are not subject to this premium charge.

EXHIBIT 2

Item 02-MO-2021— Rules and an Endorsement Related to the Catastrophe (Other Than Certified Acts of Terrorism) Provision in Missouri

Missouri Workers Compensation Premium Algorithm*

Rule ID: BM-BMPP-W0064

Effective Date: August 1, 2022

This algorithm provides the framework for premium charges and credits. Where not specified, the premium base is the result from the prior line. Use this rating method in the absence of independent carrier filings.

Missouri Workers Compensation Premium Algorithm

	PREMIUM ELEMENTS	EXPLANATORY NOTES
	MANUAL PREMIUM	[(PAYROLL / 100) * RATE]
+	Supplementary Disease (foundry, abrasive, sandblasting)	[(SUBJECT PAYROLL / 100) * DISEASE RATE]
+	USL&H Exposure for non-F-classification codes	[(SUBJECT PAYROLL / 100) * (RATE * USL&H FACTOR)]
	TOTAL MANUAL PREMIUM	
+	Waiver of Subrogation factor[1]	[% applied to the portion of Total Manual Premium where waiver is applicable, subject to minimum charge]
+	Employers Liability (E/L) increased limits factor	[% applied to Total Manual Premium]
+	Employers Liability increased limits charge	[Balance to E/L increased limits minimum premium]
+	Employers Liability increased limits factor (Admiralty law, FELA)	[Factor applied to the portion of Manual Premium where Admiralty law/FELA coverage is applicable]
+	Employers Liability/Voluntary Compensation flat charge	[Coverage in Monopolistic State Funds]
–	Small Deductible credit[2]	[% applied to Total Manual Premium]
	TOTAL SUBJECT PREMIUM	
x	Experience Modification (Exp Mod)	
	TOTAL MODIFIED PREMIUM	
x	Contracting Class Prem Adj Program factor (1 – CCPAP credit %)	
x	Schedule Rating factor or Risk Modeling Plan factor (1 – credit %) or (1 + debit %) [3]	[% applied to Total Modified Premium]
+	Supplemental Disease Exposure (Asbestos, NOC)[4, 5]	
+	Atomic Energy Radiation Exposure NOC[4, 5]	
+	Charge for nonratable catastrophe loading[5]	
+	Balance to Minimum Premium (State Act)	[Balance to minimum premium at Standard Limits]
+	Balance to Minimum Premium (Admiralty law, FELA)	
	TOTAL STANDARD PREMIUM	
–	Premium Discount[6]	[% applied to Standard Premium]
+	Coal Mine Disease Charge	[Underground, surface, surface auger]
+	Expense Constant	

	PREMIUM ELEMENTS	EXPLANATORY NOTES
+	Terrorism	[(PAYROLL / 100) * TERRORISM VALUE]
±	Catastrophe (other than Certified Acts of Terrorism)	[(PAYROLL / 100) * CATASTROPHE (OTHER THAN CERTIFIED ACTS OF TERRORISM) VALUE]
	ESTIMATED ANNUAL PREMIUM	
+	Audit Noncompliance Charge	
	TOTAL AMOUNT DUE	

1 Premium charges established for Waiver of Subrogation are not filed by NCCI for the voluntary market.
2 Second Injury Fund assessments are calculated as if the deductible plan were not being used.
3 Schedule Rating and Risk Modeling Plans are individually filed by each carrier. Carriers have the option of filing a Schedule Rating Plan or a Risk Modeling Plan.
4 Not Otherwise Classified.
5 Nonratable Element Premiums generated by nonratable portion of manual rate are subject to all applicable premium elements applied to the policy, however, not subject to experience rating or retrospective rating.
6 For policies subject to premium adjustments under a retrospective rating plan, premium discount does not apply.

Note For short-rate cancellations, short-rate percentage/short-rate penalty premium factor is subject to experience rating, included in Total Subject Premium, and applied prior to Experience Modification.

EXHIBIT 3

Item 02-MO-2021— Rules and an Endorsement Related to the Catastrophe (Other Than Certified Acts of Terrorism) Provision in Missouri

MISSOURI ADVISORY MISCELLANEOUS VALUES

Effective Date: August 1, 2022

Catastrophe (other than Certified Acts of Terrorism) - (Advisory Loss Cost)*	0.01

*Effective August 1, 2022, per Item 02-MO-2021.

ITEM 02-MO-2021—RULES AND AN ENDORSEMENT RELATED TO THE CATASTROPHE (OTHER THAN CERTIFIED ACTS OF TERRORISM) PROVISION IN MISSOURI

EXHIBIT 4
STATISTICAL PLAN—2008 EDITION

PART 6—CODING VALUES

E. STATISTICAL CODES

3. Premium Amount *Not Part* of Standard Premium

Phraseology	Stat Code	Premium Credit (–) or Debit (+)	Applicable States	Effective Date	Discontinued Date	Notes (If Applicable)
Catastrophe Provisions for Catastrophe (Other Than Certified Acts of Terrorism)	9741	Debit (+)	MO	08/01/2022		

NATIONAL COUNCIL ON COMPENSATION INSURANCE, INC. 02-MO-2021

ITEM 02-MO-2021—RULES AND AN ENDORSEMENT RELATED TO THE CATASTROPHE (OTHER THAN CERTIFIED ACTS OF TERRORISM) PROVISION IN MISSOURI

EXHIBIT 5
FORMS MANUAL OF WORKERS COMPENSATION AND EMPLOYERS LIABILITY INSURANCE CATASTROPHE (OTHER THAN CERTIFIED ACTS OF TERRORISM) PREMIUM ENDORSEMENT (WC 00 04 21 F)

Catastrophe (Other Than Certified Acts of Terrorism) Premium Endorsement (WC 00 04 21 F)

This endorsement is notification that we are charging premium to cover the losses that may occur in the event of a Catastrophe (Other Than Certified Acts of Terrorism) as that term is defined below. Your policy provides coverage for workers compensation losses caused by a Catastrophe (Other Than Certified Acts of Terrorism). Coverage for such losses is subject to all terms, definitions, exclusions, and conditions in your policy, and any applicable federal and/or state laws, rules, or regulations. This premium charge does not provide funding for Certified Acts of Terrorism contemplated under the Terrorism Risk Insurance Program Reauthorization Act Disclosure Endorsement attached to this policy.

For purposes of this endorsement, Catastrophe (Other Than Certified Acts of Terrorism) is defined as:
A single event or peril resulting in a group of claims with aggregate workers compensation losses in excess of $50 million. This $50 million threshold applies per occurrence, across all states for which claims arise from a single event or peril.

The premium charge for the coverage your policy provides for workers compensation losses caused by a Catastrophe (Other Than Certified Acts of Terrorism) is shown in Item 4 of the Information Page or in the Schedule below.

Schedule

State	Rate	Premium

NATIONAL COUNCIL ON COMPENSATION INSURANCE, INC. **02-MO-2021**

ITEM 02-MO-2021—RULES AND AN ENDORSEMENT RELATED TO THE CATASTROPHE (OTHER THAN CERTIFIED ACTS OF TERRORISM) PROVISION IN MISSOURI

INFORMATIONAL EXHIBIT
CATASTROPHE (OTHER THAN CERTIFIED ACTS OF TERRORISM)
VOLUNTARY LOSS COST CALCULATION

State	Countrywide Average Annual $ Loss Per Worker (1)	Average Weekly Wage (2)	Average Annual Salary (3) = (2) x 52	Indicated $ Loss Per $100 Payroll (4) = (1)/ [(3) /100]	Loss-Based Expense Provision (5)	Indicated Pandemic Loss Cost (6) = (4) x (5)	Proposed Selected Catastrophe Loss Cost (7)
Missouri	8.43	1,045	54,340	0.016	1.193	0.019	0.01

Column Sources/Notes:
(1) Modeled Countrywide Workers Compensation Pandemic losses above $50M per occurrence
(2) U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, NCCI weighted state average weekly wage for 2019
(5) Exhibit II of the 1/1/2021 approved Missouri Loss Cost Filing
(7) Selection based on actuarial judgement

NATIONAL COUNCIL ON COMPENSATION INSURANCE
2021 ANNUAL COUNTRYWIDE ADJUSTING AND OTHER EXPENSE REVIEW

Each year, NCCI calculates a countrywide (CW) adjusting and other expense (AOE) provision. This file provides the CW AOE provision that will be filed as applicable during the 2021–2022 filing season.

NCCI calculates ultimate AOE ratios by accident year, separately for both paid and incurred data (paid plus unpaid). The average of the paid and incurred AOE ratio indications are also calculated. The AOE ratios by year as well as the selected provision are shown in Exhibit 1.

Exhibit 1: Ultimate AOE Ratios and Countrywide Selection

Accident Year	Ultimate AOE Ratio Based on Paid Data	Ultimate AOE Ratio Based on Incurred Data	Ultimate AOE Ratio Based on Avg. of Paid and Incurred Data
2016	8.5%	8.5%	8.5%
2017	9.1%	9.0%	9.1%
2018	9.2%	9.0%	9.1%
2019	9.6%	9.2%	9.4%
2020	10.4%	9.2%	9.8%
		Selected AOE Provision	**9.4%**

During this year's analysis, which included an assessment of pandemic claim-related impacts, a provision of 9.4% was selected as most appropriate in terms of providing a balance between stability and responsiveness.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
2021 ANNUAL COUNTRYWIDE ADJUSTING AND OTHER EXPENSE REVIEW

Data Used

NCCI uses private carrier data reported on NCCI Call 19 to calculate the ultimate AOE ratios. Call 19 is a CW Call in which data is reported for the most recent 10 individual accident years, in addition to an aggregated "prior line" in which data is reported for all years older than the most recent 10. The data reported includes losses and AOE on both a paid and unpaid basis. Further, the Call 19 data is reported for all policy types—including that for large deductible policies.

Methodology Overview

To determine the ultimate AOE ratios, NCCI uses the following methodology:

- After developing AOE and losses separately to a 10th report, calculate the ratio of AOE-to-losses at that age of maturity
- Apply a 10th-to-ultimate (tail) factor to the AOE ratios at a 10th report
- Apply the adjustment to reverse AOE credits
  - Carriers may credit their AOE amounts for reimbursement of claims-handling provided to policyholders (such as for claims below a deductible amount) or for other service fees charged related to claims-handling. The purpose of this adjustment is to add these credits back in to put AOE on a first-dollar basis.
- Apply the adjustment for losses associated with Third-Party Administrator (TPA) Agreements
  - As a result of TPA agreements, some carriers report losses on Call 19 without associated AOE. The purpose of this adjustment is to remove these losses from the analysis.
- Apply the adjustment to convert losses from a net-of-deductible to a gross-of-deductible basis
  - Up to this point in the calculation, the data used includes losses from large deductible policies, net of the deductible. The purpose of this adjustment is to convert the data to a full coverage basis, allowing the AOE provision to be on the same basis as the losses used in individual state experience filings.
- Apply an adjustment to exclude the losses from reported COVID-19 pandemic related claims
  - The percentage of reported COVID-19 pandemic related losses to total losses is removed from the denominator of the AY 2020 AOE ratio to better reflect the conditions likely to prevail during the effective period of the 2021–2022 filing season.

NATIONAL COUNCIL ON COMPENSATION INSURANCE
2021 ANNUAL COUNTRYWIDE ADJUSTING AND OTHER EXPENSE REVIEW

Exhibit 2: Calculation of Ultimate AOE Ratios—Paid Data

Accident Year	(1) Paid AOE at Current Report	(2) Cumulative Paid AOE Development Factors	(3)=(1)x(2) Estimated Paid AOE Developed to a 10th Report	(4) Paid Losses at Current Report	(5) Cumulative Paid Loss Development Factors	(6)=(4)x(5) Estimated Paid Losses Developed to a 10th Report	(7) 10th Report-to-Ultimate Paid AOE Tail Factor
2016	1,877,466,237	1.092	2,050,193,131	15,879,742,948	1.130	17,944,109,531	0.92
2017	1,911,456,406	1.143	2,184,794,672	15,015,586,251	1.208	18,138,828,191	0.92
2018	1,857,755,012	1.225	2,275,749,890	13,995,848,360	1.360	19,034,353,770	0.92
2019	1,722,318,435	1.401	2,412,968,127	10,903,787,755	1.745	19,027,109,632	0.92
2020	1,066,217,940	2.087	2,225,196,841	4,308,640,438	3.787	16,316,821,339	0.92

Accident Year	(8)=(3)/(6)x(7) Estimated Ultimate AOE Ratio Before Adjustments	(9) Adjustment to Reverse AOE Credits	(10) Adjustment for Losses Associated with TPA Agreements	(11) Adjustment to Convert Losses From Net to Gross of Deductible	(12) Pct. of Reported COVID-19-Related Losses to Total Losses	(13)=[(8)+(9)]x(10)x(11)/[1-(12)] Estimated Ultimate AOE Ratio After Adjustments
2016	10.5%	0.011	1.049	0.70	-	8.5%
2017	11.0%	0.013	1.056	0.70	-	9.1%
2018	11.0%	0.014	1.058	0.70	-	9.2%
2019	11.7%	0.012	1.063	0.70	-	9.6%
2020	12.5%	0.012	1.065	0.70	2.0%	10.4%

NATIONAL COUNCIL ON COMPENSATION INSURANCE
2021 ANNUAL COUNTRYWIDE ADJUSTING AND OTHER EXPENSE REVIEW

Exhibit 3: Calculation of Ultimate AOE Ratios—Incurred Data

Accident Year	(1) Incurred AOE at Current Report	(2) Cumulative Incurred AOE Development Factors	(3)=(1)x(2) Estimated Incurred AOE Developed to a 10th Report	(4) Incurred Losses at Current Report	(5) Cumulative Incurred Loss Development Factors	(6)=(4)x(5) Estimated Incurred Losses Developed to a 10th Report	(7) 10th Report-to-Ultimate Incurred AOE Tail Factor
2016	2,216,009,400	1.015	2,249,249,541	22,775,644,146	0.960	21,864,618,380	1.01
2017	2,355,501,371	1.014	2,388,478,390	23,601,906,879	0.937	22,114,986,746	1.01
2018	2,429,616,009	1.008	2,449,052,937	25,191,363,333	0.911	22,949,331,996	1.01
2019	2,537,961,346	0.989	2,510,043,771	25,841,028,131	0.884	22,843,468,868	1.01
2020	2,260,212,629	0.982	2,219,528,802	23,759,962,651	0.870	20,671,167,506	1.01

Accident Year	(8)=(3)/(6)x(7) Estimated Ultimate AOE Ratio Before Adjustments	(9) Adjustment to Reverse AOE Credits	(10) Adjustment for Losses Associated with TPA Agreements	(11) Adjustment to Convert Losses From Net to Gross of Deductible	(12) Pct. of Reported COVID-19-Related Losses to Total Losses	(13)=[(8)+(9)]x(10)x(11)/[1-(12)] Estimated Ultimate AOE Ratio After Adjustments
2016	10.4%	0.011	1.049	0.70	-	8.5%
2017	10.9%	0.013	1.056	0.70	-	9.0%
2018	10.8%	0.014	1.058	0.70	-	9.0%
2019	11.1%	0.012	1.063	0.70	-	9.2%
2020	10.8%	0.012	1.065	0.70	2.0%	9.2%

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Exhibit 4: AOE Tail Factor Selection—Paid

Valuation Date	(1) Paid AOE 10th-to-Ultimate	(2) Paid Losses 10th-to-Ultimate	(3) = (1)/(2) Paid AOE-to-Losses 10th-to-Ultimate Tail Factor
12/31/2013	1.118	1.252	0.893
12/31/2014	1.089	1.233	0.883
12/31/2015	1.057	1.214	0.871
12/31/2016	1.081	1.198	0.902
12/31/2017	1.073	1.192	0.900
12/31/2018	1.115	1.138	0.980
12/31/2019	1.094	1.163	0.941
12/31/2020	1.117	1.135	0.984
		Selected Paid AOE Tail Factor	**0.920**

Exhibit 5: AOE Tail Factor Selection—Incurred

Valuation Date	(1) Incurred AOE 10th-to-Ultimate	(2) Incurred Losses 10th-to-Ultimate	(3) = (1)/(2) Incurred AOE-to-Losses 10th-to-Ultimate Tail Factor
12/31/2013	1.051	1.039	1.012
12/31/2014	1.027	1.033	0.994
12/31/2015	0.999	1.017	0.982
12/31/2016	1.003	0.995	1.008
12/31/2017	1.000	0.997	1.003
12/31/2018	1.041	0.960	1.084
12/31/2019	1.007	0.976	1.032
12/31/2020	1.020	0.967	1.055
		Selected Incurred AOE Tail Factor	**1.010**

Exhibit 10b

Missouri

Derivation of the Adjusting and Other Expense (AOE) Provision

	Private Carrier			Missouri Employers Mutual		
	(1)	(2)	(3) = [(1)+(2)]/2	(4)	(5)	(6) = [(4)+(5)]/2
	Ultimate AOE Ratio Based on	Ultimate AOE Ratio Based on	Average Ultimate AOE	Ultimate AOE Ratio Based on	Ultimate AOE Ratio Based on	Average Ultimate AOE
AY	Paid Data	Incurred Data	Ratio	Paid Data	Incurred Data	Ratio
2016	8.5%	8.5%	8.5%	9.7%	9.1%	9.4%
2017	9.1%	9.0%	9.1%	9.4%	8.5%	9.0%
2018	9.2%	9.0%	9.1%	9.8%	8.8%	9.3%
2019	9.6%	9.2%	9.4%	11.4%	10.4%	10.9%
2020	10.4%	9.2%	9.8%	13.2%	10.8%	12.0%
(7) Selected AOE ratio			**9.4%**			**9.9%**
(8) Weights			73%			27%

(9) Weighted-average AOE ratio = (0.094 x 0.73) + (0.099 x 0.27) = **9.5%**

Exhibit 10c - Missouri DCCE

Section A - Selection of DCCE Provision

Policy Year	(1) Reported Ratio of Paid DCCE to Paid Losses	(2) Age to Ultimate Development Factor	(3) Ultimate DCCE Ratio
2015	10.5%	0.966	10.1%
2016	10.6%	0.962	10.2%
2017	10.0%	0.972	9.7%
2018	9.9%	0.997	9.9%
2019	9.3%	1.076	10.0%
		Missouri Selected	**10.0%**

(2) Section B

(3) = (1) x (2)

Section B - Summary of Paid DCCE to Paid Loss Ratio Development Factors

Report	(1) DCCE Ratio Development To Next Report	(2) DCCE Ratio Development To Ultimate
1st	1.079	1.076
2nd	1.026	0.997
3rd	1.010	0.972
4th	0.996	0.962
5th	0.998	0.966
6th	0.999	0.968
7th	0.992	0.969
8th	0.997	0.977
9th	0.995	0.980
10th	1.000	0.985
11th	1.002	0.985
12th	1.000	0.983
13th	0.997	0.983
14th	0.997	0.986
15th	0.998	0.989
16th	0.997	0.991
17th	0.998	0.994
18th	1.001	0.996
19th		0.995*

(1) Section C

(2) = Cumulative upward product of column (1)

*Selection

Exhibit 10c - Missouri DCCE

Section C - Paid DCCE to Paid Loss Ratio Development Factors

Valuation	1st/2nd	2nd/3rd	3rd/4th	4th/5th	5th/6th	6th/7th
12/31/2019	1.090	1.023	1.001	1.000	1.002	0.995
12/31/2020	1.068	1.029	1.018	0.992	0.994	1.002
Average	1.079	1.026	1.010	0.996	0.998	0.999

Valuation	7th/8th	8th/9th	9th/10th	10th/11th	11th/12th	12th/13th
12/31/2019	0.995	0.996	0.995	1.000	1.002	0.999
12/31/2020	0.988	0.997	0.994	1.000	1.001	1.001
Average	0.992	0.997	0.995	1.000	1.002	1.000

Valuation	13th/14th	14th/15th	15th/16th	16th/17th	17th/18th	18th/19th
12/31/2019	0.997	0.997	0.998	0.995	0.999	1.001
12/31/2020	0.996	0.996	0.998	0.998	0.996	1.000
Average	0.997	0.997	0.998	0.997	0.998	1.001

Missouri

1/1/2022

Exhibit 13

	Policy Period	(1) PY Standard Earned Premiums	(2) Premiums @ PY Manual Rates	Current Manual to Standard Ratio (2)/(1)	Policy Period	(3) PY Standard Earned Premiums	(4) Premiums @ PY Manual Rates	Proposed Manual to Standard Ratio (4)/(3)
Manufacturing	**7/13-6/14**	222,009,841	279,735,283		**7/14-6/15**	232,511,405	293,853,138	
	7/14-6/15	232,439,158	293,702,567		**7/15-6/16**	230,979,377	290,850,296	
	7/15-6/16	230,982,906	290,874,238		**7/16-6/17**	233,283,946	293,511,048	
	7/16-6/17	232,289,469	292,288,442		**7/17-6/18**	245,745,708	308,640,385	
	7/17-6/18	243,593,444	304,607,697		**7/18-6/19**	247,187,910	311,809,693	
	5 Yr Totals	1,161,314,818	1,461,208,227	1.258	5 Yr Totals	1,189,708,346	1,498,664,560	1.260
Contracting	**7/13-6/14**	289,061,775	322,364,855		**7/14-6/15**	320,895,341	361,970,347	
	7/14-6/15	320,850,952	361,899,314		**7/15-6/16**	340,835,179	384,947,670	
	7/15-6/16	340,894,092	385,033,841		**7/16-6/17**	332,487,880	373,956,736	
	7/16-6/17	332,663,066	374,203,093		**7/17-6/18**	325,136,918	365,225,319	
	7/17-6/18	326,282,342	366,416,407		**7/18-6/19**	326,409,147	366,870,749	
	5 Yr Totals	1,609,752,227	1,809,917,510	1.124	5 Yr Totals	1,645,764,465	1,852,970,821	1.126
Office & Clerical	**7/13-6/14**	160,292,725	181,260,989		**7/14-6/15**	165,315,150	188,891,828	
	7/14-6/15	164,879,374	187,499,859		**7/15-6/16**	164,730,046	188,780,086	
	7/15-6/16	164,730,413	188,779,696		**7/16-6/17**	163,709,327	188,531,348	
	7/16-6/17	163,704,664	188,456,926		**7/17-6/18**	163,338,525	185,394,001	
	7/17-6/18	162,731,149	184,635,343		**7/18-6/19**	163,076,080	181,863,732	
	5 Yr Totals	816,338,325	930,632,813	1.140	5 Yr Totals	820,169,128	933,460,995	1.138
Goods & Services	**7/13-6/14**	380,262,527	406,138,517		**7/14-6/15**	400,289,020	432,583,137	
	7/14-6/15	399,768,337	431,570,412		**7/15-6/16**	406,708,633	442,876,004	
	7/15-6/16	406,789,502	442,937,456		**7/16-6/17**	406,678,850	442,447,773	
	7/16-6/17	405,376,712	441,612,061		**7/17-6/18**	417,771,100	453,661,749	
	7/17-6/18	415,150,286	451,003,468		**7/18-6/19**	410,089,633	447,481,956	
	5 Yr Totals	2,007,347,364	2,173,261,914	1.083	5 Yr Totals	2,041,537,236	2,219,050,619	1.087
Miscellaneous	**7/13-6/14**	236,942,977	255,230,302		**7/14-6/15**	252,476,000	274,208,677	
	7/14-6/15	252,433,172	274,166,456		**7/15-6/16**	264,288,768	282,707,875	
	7/15-6/16	264,304,824	282,728,323		**7/16-6/17**	267,542,068	286,713,305	
	7/16-6/17	267,650,506	286,788,896		**7/17-6/18**	277,593,121	293,351,147	
	7/17-6/18	277,589,330	293,160,800		**7/18-6/19**	278,213,644	298,452,089	
	5 Yr Totals	1,298,920,809	1,392,074,777	1.072	5 Yr Totals	1,340,113,601	1,435,433,093	1.071

LIMITED INDEMNITY LOSS DEVELOPMENT

Likely

Missouri

01/01/22

PY Data	1st Report	2nd Report	3rd Report	4th Report	5th Report	6th Report	7th Report	8th Report	9th Report	10th Report
7/05-6/06	*76,947,671*	*91,690,283*	*101,288,877*	*107,913,115*	*112,385,948*	*114,492,756*	*116,431,008*	*117,483,461*	118,047,324	119,013,915
7/06-6/07	*76,140,429*	*88,429,315*	*97,122,490*	*102,414,309*	*106,329,085*	*108,223,440*	*110,895,382*	111,665,771	112,488,047	113,668,298
7/07-6/08	*77,323,191*	*93,390,680*	*101,811,778*	*107,897,799*	*111,698,789*	*116,127,037*	117,726,530	118,428,820	119,979,745	120,041,004
7/08-6/09	*60,056,111*	*72,230,419*	*81,623,268*	*86,439,771*	*91,063,778*	93,644,828	95,068,921	96,622,964	96,975,915	97,418,302
7/09-6/10	*62,432,683*	*75,716,217*	*83,034,104*	*89,865,106*	96,748,706	100,052,564	101,358,956	103,317,336	103,554,732	103,459,678
7/10-6/11	*59,870,667*	*73,966,189*	*84,905,974*	90,360,559	96,020,802	97,927,150	100,556,582	100,314,345	100,472,625	
7/11-6/12	*58,045,953*	*71,694,986*	80,390,193	86,894,864	91,855,328	95,134,267	96,142,685	97,498,932		
7/12-6/13	*54,835,449*	69,380,639	80,366,338	87,654,735	91,252,185	94,604,277	97,520,116			
7/13-6/14	57,635,421	75,116,052	87,085,600	93,849,791	99,615,885	103,866,635				
7/14-6/15	64,560,921	81,329,756	92,519,271	100,117,427	104,506,219					
7/15-6/16	62,399,313	79,157,363	89,176,575	95,744,406						
7/16-6/17	61,862,720	78,642,126	89,990,356							
7/17-6/18	63,422,537	79,583,609								
7/18-6/19	63,701,074									

Link Ratios	1:2	2:3	3:4	4:5	5:6	6:7	7:8	8:9	9:10
7/05-6/06	*1.192*	*1.105*	*1.065*	*1.041*	*1.019*	*1.017*	*1.009*	*1.005*	1.008
7/06-6/07	*1.161*	*1.098*	*1.054*	*1.038*	*1.018*	*1.025*	*1.007*	1.007	1.010
7/07-6/08	*1.208*	*1.090*	*1.060*	*1.035*	*1.040*	*1.014*	1.006	1.013	1.001
7/08-6/09	*1.203*	*1.130*	*1.059*	*1.053*	*1.028*	1.015	1.016	1.004	1.005
7/09-6/10	*1.213*	*1.097*	*1.082*	*1.077*	1.034	1.013	1.019	1.002	0.999
7/10-6/11	*1.235*	*1.148*	*1.064*	1.063	1.020	1.027	0.998	1.002	
7/11-6/12	*1.235*	*1.121*	1.081	1.057	1.036	1.011	1.014		
7/12-6/13	*1.265*	1.158	1.091	1.041	1.037	1.031			
7/13-6/14	1.303	1.159	1.078	1.061	1.043				
7/14-6/15	1.260	1.138	1.082	1.044					
7/15-6/16	1.269	1.127	1.074						
7/16-6/17	1.271	1.144							
7/17-6/18	1.255								

AVERAGE DEV.	1:2	2:3	3:4	4:5	5:6	6:7	7:8	8:9	9:10
5 Year Averages	1.272	1.145	1.081	1.053	1.034	1.019	1.011	1.006	1.005

AVG DEV. TO ULT.	1:U	2:U	3:U	4:U	5:U	6:U	7:U	8:U	9:U	10:U
5 Year Averages	1.890	1.486	1.298	1.201	1.141	1.103	1.082	1.070	1.064	1.059

LIMITED INDEMNITY LOSS DEVELOPMENT

Not-Likely

Missouri

01/01/22

PY Data	1st Report	2nd Report	3rd Report	4th Report	5th Report	6th Report	7th Report	8th Report	9th Report	10th Report
7/05-6/06	*147,478,853*	*157,943,608*	*164,060,221*	*166,495,078*	*169,362,459*	*169,315,079*	*170,012,167*	*169,695,199*	169,884,450	169,487,780
7/06-6/07	*151,819,694*	*164,230,930*	*169,498,764*	*173,131,217*	*174,361,556*	*175,769,718*	*175,355,137*	175,604,930	175,916,976	175,564,477
7/07-6/08	*147,714,143*	*159,379,477*	*167,941,265*	*172,880,371*	*173,571,859*	*174,182,814*	175,146,585	175,184,872	175,009,255	175,171,636
7/08-6/09	*139,687,182*	*154,274,723*	*162,009,873*	*164,259,555*	*164,639,976*	166,277,817	167,130,375	167,879,518	167,598,132	167,979,672
7/09-6/10	*134,849,777*	*146,345,111*	*154,579,279*	*157,834,574*	159,958,766	159,770,939	160,002,837	162,024,245	162,054,511	162,163,601
7/10-6/11	*140,897,267*	*156,186,337*	*164,446,298*	167,299,133	170,091,951	172,775,263	172,962,399	172,434,640	173,062,723	
7/11-6/12	*140,505,102*	*153,215,704*	163,085,788	166,077,667	168,416,294	169,602,133	170,954,087	170,359,528		
7/12-6/13	*154,192,792*	169,246,651	178,042,750	182,999,734	185,111,136	187,638,568	188,742,013			
7/13-6/14	155,553,142	172,090,336	182,049,311	188,079,751	190,062,622	192,396,342				
7/14-6/15	161,524,545	181,082,853	191,978,072	197,941,017	200,682,312					
7/15-6/16	164,693,869	181,952,171	191,586,416	196,401,339						
7/16-6/17	166,077,025	183,195,933	194,857,023							
7/17-6/18	177,836,092	197,360,967								
7/18-6/19	177,752,821									

Link Ratios	1:2	2:3	3:4	4:5	5:6	6:7	7:8	8:9	9:10
7/05-6/06	*1.071*	*1.039*	*1.015*	*1.017*	*1.000*	*1.004*	*0.998*	*1.001*	0.998
7/06-6/07	*1.082*	*1.032*	*1.021*	*1.007*	*1.008*	*0.998*	*1.001*	1.002	0.998
7/07-6/08	*1.079*	*1.054*	*1.029*	*1.004*	*1.004*	*1.006*	1.000	0.999	1.001
7/08-6/09	*1.104*	*1.050*	*1.014*	*1.002*	*1.010*	1.005	1.004	0.998	1.002
7/09-6/10	*1.085*	*1.056*	*1.021*	*1.013*	0.999	1.001	1.013	1.000	1.001
7/10-6/11	*1.109*	*1.053*	*1.017*	1.017	1.016	1.001	0.997	1.004	
7/11-6/12	*1.090*	*1.064*	1.018	1.014	1.007	1.008	0.997		
7/12-6/13	*1.098*	1.052	1.028	1.012	1.014	1.006			
7/13-6/14	1.106	1.058	1.033	1.011	1.012				
7/14-6/15	1.121	1.060	1.031	1.014					
7/15-6/16	1.105	1.053	1.025						
7/16-6/17	1.103	1.064							
7/17-6/18	1.110								

AVERAGE DEV.	1:2	2:3	3:4	4:5	5:6	6:7	7:8	8:9	9:10
5 Year Averages	1.109	1.057	1.027	1.014	1.010	1.004	1.002	1.001	1.000

AVG DEV. TO ULT.	1:U	2:U	3:U	4:U	5:U	6:U	7:U	8:U	9:U	10:U
5 Year Averages	1.251	1.128	1.067	1.039	1.025	1.015	1.011	1.009	1.008	1.008

LIMITED MEDICAL LOSS DEVELOPMENT

Likely

Missouri

01/01/22

PY Data	1st Report	2nd Report	3rd Report	4th Report	5th Report	6th Report	7th Report	8th Report	9th Report	10th Report
7/05-6/06	*99,323,294*	*106,494,451*	*110,979,108*	*114,405,386*	*114,845,328*	*114,274,953*	*114,483,824*	*115,053,323*	114,218,196	114,214,813
7/06-6/07	*100,854,536*	*105,262,138*	*108,886,106*	*110,393,045*	*111,390,966*	*111,011,418*	*112,211,487*	113,066,299	113,408,269	114,173,457
7/07-6/08	*100,533,090*	*106,442,753*	*110,879,923*	*114,192,455*	*114,978,382*	*114,979,764*	115,149,833	115,033,467	114,769,376	114,524,663
7/08-6/09	*81,308,701*	*88,082,227*	*89,043,099*	*90,604,958*	*91,445,358*	90,922,546	90,663,811	90,810,422	90,696,941	90,496,918
7/09-6/10	*88,550,954*	*96,355,353*	*96,688,213*	*97,646,496*	97,962,046	97,417,674	97,200,782	97,133,560	96,810,935	96,561,268
7/10-6/11	*88,018,409*	*94,376,875*	*98,213,891*	98,751,290	98,722,736	98,753,831	98,910,309	98,490,432	98,688,176	
7/11-6/12	*87,546,132*	*92,904,216*	95,366,981	95,843,226	96,261,020	96,654,947	96,055,164	95,912,617		
7/12-6/13	*80,729,427*	89,886,118	92,190,186	92,931,783	92,417,819	92,262,710	91,918,800			
7/13-6/14	85,630,049	92,562,964	95,394,536	95,775,957	97,547,434	97,739,124				
7/14-6/15	91,090,386	98,584,419	100,346,772	100,072,364	100,307,162					
7/15-6/16	92,542,876	97,216,210	98,261,718	99,416,136						
7/16-6/17	91,566,584	99,170,752	98,965,527							
7/17-6/18	94,120,666	100,304,852								
7/18-6/19	92,828,200									

Link Ratios	1:2	2:3	3:4	4:5	5:6	6:7	7:8	8:9	9:10
7/05-6/06	*1.072*	*1.042*	*1.031*	*1.004*	*0.995*	*1.002*	*1.005*	*0.993*	1.000
7/06-6/07	*1.044*	*1.034*	*1.014*	*1.009*	*0.997*	*1.011*	*1.008*	1.003	1.007
7/07-6/08	*1.059*	*1.042*	*1.030*	*1.007*	*1.000*	*1.001*	0.999	0.998	0.998
7/08-6/09	*1.083*	*1.011*	*1.018*	*1.009*	*0.994*	0.997	1.002	0.999	0.998
7/09-6/10	*1.088*	*1.003*	*1.010*	*1.003*	0.994	0.998	0.999	0.997	0.997
7/10-6/11	*1.072*	*1.041*	*1.005*	1.000	1.000	1.002	0.996	1.002	
7/11-6/12	*1.061*	*1.027*	1.005	1.004	1.004	0.994	0.999		
7/12-6/13	*1.113*	1.026	1.008	0.994	0.998	0.996			
7/13-6/14	1.081	1.031	1.004	1.018	1.002				
7/14-6/15	1.082	1.018	0.997	1.002					
7/15-6/16	1.050	1.011	1.012						
7/16-6/17	1.083	0.998							
7/17-6/18	1.066								

AVERAGE DEV.	1:2	2:3	3:4	4:5	5:6	6:7	7:8	8:9	9:10
5 Year Averages	1.072	1.017	1.005	1.004	1.000	0.997	0.999	1.000	1.000

AVG DEV. TO ULT.	1:U	2:U	3:U	4:U	5:U	6:U	7:U	8:U	9:U	10:U
5 Year Averages	1.168	1.090	1.072	1.067	1.063	1.063	1.066	1.067	1.067	1.067

LIMITED MEDICAL LOSS DEVELOPMENT

Not-Likely

Missouri

01/01/22

PY Data	1st Report	2nd Report	3rd Report	4th Report	5th Report	6th Report	7th Report	8th Report	9th Report	10th Report
7/05-6/06	*229,660,299*	*231,894,373*	*232,046,126*	*231,763,210*	*231,264,656*	*231,053,167*	*231,442,423*	*231,216,495*	231,009,181	231,007,076
7/06-6/07	*241,306,088*	*243,502,966*	*245,021,830*	*246,691,026*	*245,444,289*	*245,542,135*	*244,872,395*	244,090,067	244,259,979	243,719,247
7/07-6/08	*243,698,504*	*247,358,461*	*249,999,026*	*249,947,070*	*249,328,107*	*248,756,488*	248,887,906	249,612,457	249,912,175	249,674,416
7/08-6/09	*235,382,638*	*240,558,389*	*243,160,990*	*242,547,891*	*241,434,652*	241,906,796	241,753,544	241,726,384	241,760,628	242,002,224
7/09-6/10	*240,954,039*	*244,818,410*	*245,967,706*	*244,378,911*	243,552,184	243,146,389	243,600,160	243,543,003	244,111,844	243,957,586
7/10-6/11	*259,348,781*	*263,873,946*	*263,920,409*	264,309,744	265,150,007	264,932,483	265,064,593	265,243,702	264,632,572	
7/11-6/12	*258,124,207*	*259,431,655*	259,912,636	260,193,525	260,469,379	260,571,939	260,664,785	259,598,297		
7/12-6/13	*281,071,154*	282,275,511	280,693,337	279,523,305	278,999,420	278,932,224	277,737,067			
7/13-6/14	288,908,676	290,057,878	290,969,302	290,891,158	290,478,287	290,017,505				
7/14-6/15	296,576,953	299,257,207	299,646,288	298,912,504	298,681,048					
7/15-6/16	313,236,878	315,751,638	318,534,833	318,096,991						
7/16-6/17	318,745,155	320,029,888	321,095,338							
7/17-6/18	342,212,611	344,937,255								
7/18-6/19	350,224,652									

Link Ratios	1:2	2:3	3:4	4:5	5:6	6:7	7:8	8:9	9:10
7/05-6/06	*1.010*	*1.001*	*0.999*	*0.998*	*0.999*	*1.002*	*0.999*	*0.999*	1.000
7/06-6/07	*1.009*	*1.006*	*1.007*	*0.995*	*1.000*	*0.997*	*0.997*	1.001	0.998
7/07-6/08	*1.015*	*1.011*	*1.000*	*0.998*	*0.998*	*1.001*	1.003	1.001	0.999
7/08-6/09	*1.022*	*1.011*	*0.997*	*0.995*	*1.002*	0.999	1.000	1.000	1.001
7/09-6/10	*1.016*	*1.005*	*0.994*	*0.997*	0.998	1.002	1.000	1.002	0.999
7/10-6/11	*1.017*	*1.000*	*1.001*	1.003	0.999	1.000	1.001	0.998	
7/11-6/12	*1.005*	*1.002*	1.001	1.001	1.000	1.000	0.996		
7/12-6/13	*1.004*	0.994	0.996	0.998	1.000	0.996			
7/13-6/14	1.004	1.003	1.000	0.999	0.998				
7/14-6/15	1.009	1.001	0.998	0.999					
7/15-6/16	1.008	1.009	0.999						
7/16-6/17	1.004	1.003							
7/17-6/18	1.008								

AVERAGE DEV.	1:2	2:3	3:4	4:5	5:6	6:7	7:8	8:9	9:10
5 Year Averages	1.007	1.002	0.999	1.000	0.999	0.999	1.000	1.000	0.999

AVG DEV. TO ULT.	1:U	2:U	3:U	4:U	5:U	6:U	7:U	8:U	9:U	10:U
5 Year Averages	1.010	1.003	1.001	1.002	1.002	1.003	1.004	1.004	1.004	1.005

EXCESS LOSS FACTOR PARAMETERS AND TABLES

2019 UPDATE

EXCESS LOSS FACTOR PARAMETERS AND TABLES — TABLE OF CONTENTS

Excess Loss Factor Parameters and Tables contains the assumptions and methodology used in NCCI filings to derive excess ratios for each state and countrywide. Excess ratios, along with incurred losses and average costs, are the key data elements underlying the computation of Excess Loss Factors (ELFs) by state.

ELFs are used to determine excess loss premium, an elective premium element of retrospective rating. NCCI revises ELFs as part of each state's annual experience filing by adjusting standardized excess ratio curves by the latest state experience and trends. For complete details on the development of ELFs for a specific state, along with a tabular display of values by hazard group and loss limit, refer to NCCI's ***Excess Loss Factor Calculations*** product for that state.

What is an Excess Ratio?

An excess ratio is defined as the ratio of the expected portion of losses (or losses and allocated loss adjustment expense) greater than a loss (claim or occurrence) limit to total losses (or losses and allocated loss adjustment expense).

Excess ratios vary based on the five countrywide claim severity distributions (curves). The claim severity distribution has a mixture of two lognormal distributions for the body and a Generalized Pareto distribution for the tail.

To produce the state-specific distributions for each claim group, NCCI adjusts the lognormal parameters of the countrywide distribution using a statistic for approximating the standard deviation for each state relative to countrywide.

Periodically, NCCI re-examines the methodology and reconstructs the curves from the most recently reported ***Statistical Plan for Workers Compensation and Employers Liability Insurance*** data (unit statistical data). Prior studies were conducted in 2004 and 2014. The 2019 update utilizes the same general Methodology as the 2014 study with more current data.

Methodology enhancements in the 2014 update included:

- Improved estimates of individual claim loss development
- Improved estimation of per claim to per occurrence adjustment
- Enhanced curve fitting techniques
- Improved estimation of values at large loss limits
- Improved calculation of values involving losses including allocated loss adjustment expense

- Improved accuracy and stability of severities and loss weights by state, hazard group, and claim group
- Expanded data up to 10th report

The 2019 update refit the severity distributions to more recent data and introduced the unlimited parameter to facilitate the exclusion of large loss events exceeding $50M.

Note: "Countrywide" refers to all jurisdictions where NCCI provides ratemaking services, excluding Texas.

Data

The calculation of the curve parameters is based on countrywide claim data from NCCI's ***Statistical Plan*** across 37 jurisdictions.

Claims are categorized into the following five groups and curve parameters are produced for each group:

- Fatal
- Permanent Total
- Permanent Partial and Temporary Total, Likely to Develop
- Permanent Partial and Temporary Total, Not Likely to Develop
- Medical Only

For fitting curve parameters, the data used is the most recent 12 months of claim data, corresponding to the five policy periods falling in Policy Years 2005 through 2010, available at 6th through 10th reports. For West Virginia, only the 6th and 7th reports were available.

Loss Development and Curve Fitting

Countrywide curves are created for each claim group by first indexing the losses for each state-report period to a mean of one (claims in each state-report period are divided by the average claim amount for the state-report period). Individual claims are then developed to ultimate using a model. Finally, for each claim group, NCCI pools the modeled data for all jurisdictions to determine a countrywide claim severity distribution.

Individual claims can develop more or less than the average development for a group of claims. This variation in individual claim development (dispersion) is taken into account when fitting the curve parameters.

State loss development factors are combined with a model to develop individual open claims to ultimate. The model is based on historical variation in individual open claim development and takes into account variations in development across different claim sizes up to 10th report. Development past a 10th report is extrapolated using the observed data through 10th report, assuming a constant claim closure rate that differs by claim group. To account for reopened claims, a small amount of loss weight, which differs by claim group, is shifted from the closed claim category to the open claim category.

The claim severity distribution has a mixture of two lognormal distributions for the body and a Generalized Pareto distribution for the tail. Parameters for the mixed lognormal distribution are determined by best fit to the data for regions where there was enough data to be credible. For higher loss limits, the number of claims is expected to be too small to develop credible excess ratios, and a Generalized Pareto distribution is fit to this region using countrywide data. Parameters for the Generalized Pareto distribution and the splice points are selected according to Extreme Value Theory.

The final countrywide curves are produced by splicing the mixture of the two lognormal distributions with the Generalized Pareto distribution. State curves are shaped directly from the countrywide curves for each claim group using the standard deviation of logged claim amounts for each state relative to the similarly adjusted countrywide claim amounts. These credibility-weighted relativities vary by claim group and are applied to the parameters of the countrywide curves. Details on the adjustment of countrywide curves to state curves are available in Appendix I.

Allocated Loss Adjustment Expense

Countrywide curves are generated by NCCI as described above for losses including allocated loss adjustment expense for each claim group. The final state curves are generated by adjusting the countrywide curves including allocated loss adjustment expense using credibility-weighted relativities calculated from losses including allocated loss adjustment expense, and then weighted at the state level with pure loss curves, using a weighting factor related to how the state ALAE factor compares to the overall countrywide ALAE factor. Exhibit VII provides further details.

How to Calculate an Excess Ratio

Up to the splice point, the excess ratio is calculated from the fitted mixture of two lognormal distributions. Beyond the splice point, the excess ratio is calculated from the

Generalized Pareto distribution. Exhibits VI and VII show the results of NCCI's calculations.

More information on NCCI's procedures for calculating excess ratios:

[1] Corro and Tseng, "NCCI's 2014 Excess Loss Factors," *Variance Journal*

NOTATION AND DEFINITIONS

Definitions

Random Variable of the Loss Distribution	X
Loss Limit	x
Average Severity Limited to x	$E[Min(X;x)]$
Percentage of Loss Distribution Limited to x	$R(x)$
R(x) Using Loss Only Unlimited Parameter and Loss Only Curve Parameters	$R(x;UP_{Loss},Loss)$
R(x) Using Loss Including ALAE Unlimited Parameter and Loss Only Curve Parameters	$R(x;UP_{ALAE},Loss)$
R(x) Using Loss Including ALAE Unlimited Parameter and Loss Including ALAE Curve Parameters	$R(x;UP_{ALAE},ALAE)$
Claim Group Average Cost per Case *	ACC_i
Claim Group Claim Count Weight *	CCW_i
Claim Group Loss Weight *	LW_i
Cumulative Probability (Loss only)	$F(x)$
Excess Ratio	$E(x)$
State ALAE Factor *	$ALAE_{ST}$
Countrywide ALAE Factor	$ALAE_{CW}$
Unlimited Parameter *	UP_{Loss}, UP_{ALAE}

* From ***Excess Loss Factor Calculations***

Excess Ratio Curve Parameters for Applicable State and Claim Group

Lognormal Mixture Frequency Weights	w_1, w_2
Lognormal Distribution Parameters	$\mu_1, \mu_2, \sigma_1, \sigma_2$
Splice Point	a
Mean Excess Loss at Splice Point	b
Per Unit Increase in the Mean Excess Loss Above Splice Point	m
Probability of Exceeding Splice Point	S

Standard Mathematical and Statistical Notation

Natural Logarithm Base	e
Standard Normal Distribution Function	$\Phi(z)$

FORMULA FOR EXCESS RATIO

Claim Group Per Claim Formula for Percentage of Loss Distribution Limited to x

If $\frac{x}{UP} \leq a$, then

$$R(x) = \sum_{k=1}^{2} w_k \left\{ e^{\left(\mu_k + \frac{\sigma_k^2}{2}\right)} \Phi\left(\frac{\ln \frac{x}{UP} - \mu_k - \sigma_k^2}{\sigma_k} \right) + \frac{x}{UP} \left[1 - \Phi\left(\frac{\ln \frac{x}{UP} - \mu_k}{\sigma_k} \right) \right] \right\}$$

If $\frac{x}{UP} > a$, then

$$R(x) = 1 - S \cdot b \cdot \left(1 + m \, \frac{\frac{x}{UP} - a}{b} \right)^{-\frac{1}{m}}$$

For curve parameter values, see Exhibits IV and V.

UP values can be found in ***Excess Loss Factor Calculations.***

Claim Group per Claim Formula for Loss Only Average Severity Limited to x

$$E[Min(X; x)] = UP_{Loss} \cdot R(x; UP_{Loss}, Loss)$$

Claim Group per Claim Formula for Loss Including Allocated Loss Adjustment Expense Average Severity Limited to x

$$E[Min(X;x)] = UP_{ALAE} \cdot \left[R(x;UP_{ALAE},Loss) + \frac{ALAE_{ST}-1}{ALAE_{CW}-1}\left(R(x;UP_{ALAE},ALAE) - R(x;UP_{ALAE},Loss)\right)\right]$$

Subject to:

- Floor of $UP_{Loss} \cdot R(x;UP_{Loss},Loss)$
- Ceiling of $UP_{Loss} \cdot R(x;UP_{Loss},Loss) + UP_{ALAE} - UP_{Loss}$

The appropriate value to use for $ALAE_{CW}$ for the 2019 Update to the curve parameters is 1.132. The value to use for $ALAE_{State}$ is the ALAE factor appropriate for the state and time period found in ***Excess Loss Factors Calculations.***

Note: The excess ratio curve can be viewed as a weighted ratio function component $R_i(x;UP_{ALAE},Loss) + \left(\frac{ALAE_{State}-1}{ALAE_{CW}-1}\right)\left(R_i(x;UP_{ALAE},ALAE) - R_i(x;UP_{ALAE},Loss)\right)$, with a lower bound of the Loss Only Average Severity Limited to x representing regions where the additional ALAE has no contribution to the excess, and an upper bound of Loss Only Average Severity Limited to $x + UP_{ALAE} - UP_{Loss}$ representing regions where the additional ALAE has full contribution to the excess.

Because the cumulative distribution function is determined by this formulaic adjustment of excess ratios rather than from a loss distribution, this construction does not necessarily correspond to any cumulative distribution function. Accordingly, neither formulas nor sample test values are provided for the cumulative distribution function for loss including ALAE.

Claim Group per Claim Excess Ratio

$$E(x) = 1 - \frac{E(Min(X;x)])}{ACC}$$

ACC values can be found in ***Excess Loss Factor Calculations***

Overall per Claim Excess Ratio

$E(x) = \sum_{Claim\ Group=\ i} LW_i \cdot E_i(x)$

FORMULA FOR CUMULATIVE PROBABILITY (LOSS ONLY)

Claim Group Cumulative Probability

For each claim group, i in a given state,

If $\frac{x}{UP} \leq a$, then,

$$F(x) = w_1 \Phi\left(\frac{\ln\frac{x}{UP} - \mu_1}{\sigma_1}\right) + w_2 \Phi\left(\frac{\ln\frac{x}{UP} - \mu_2}{\sigma_2}\right)$$

If $\frac{x}{UP} > a$, then,

$$F(x) = 1 - S \cdot \left[\left(\frac{m\left(\frac{x}{UP} - a\right) + b}{b}\right)^{-\frac{m+1}{m}}\right]$$

For parameter values see Exhibit IV*.*

Overall per Claim Cumulative Probability

$$F(x) = \sum_{Claim\ Group = i} CCW_i \cdot F_i(x)$$

ADJUSTMENT TO PER OCCURRENCE EXCESS RATIO

A per occurrence excess ratio, for all claim groups combined, is determined by interpolation from the Per Claim to Per Occurrence Conversion Table (see below). The table was developed by modeling occurrences via simulation using policy number, policy effective date, and accident date from historical countrywide data. The model also accounts for observed positive correlation in claim size between claims within an occurrence.

While the input parameters are characteristic of countrywide experience, they do not account for losses occurring from catastrophic perils such as earthquake, terrorism, and large industrial accidents.

Based on an analysis of the data, it was estimated that 2.0% of all claims were part of a multiclaim occurrence, and that the correlation of claim size between claims in a multi-claim occurrence has a coefficient of 0.25.

Parameters for Occurrence Simulation Model

Average Claim Count per Non-Singleton Occurrence	2.71
Average Claim Count per Occurrence	1.01278

Probability Distribution Given a Non-Singleton Occurrence

Claim Count per Non-Singleton Occurrence	Probability
2	73.3%
3	14.3%
4	5.1%
5	2.4%
6	1.2%
7	0.8%
8	0.6%
9	0.4%
10	0.2%
More than 10	1.7%

ADJUSTMENT TO PER OCCURRENCE EXCESS RATIO

Type of Occurrence Distributions

Type of Occurrence	Losses	Claim Counts
Singleton	88.8%	98%
Non-Singleton	11.2%	2%
Combined	100.0%	100.0%

Claim Group Distributions

Claim Group	Singleton		Non-Singleton	
	Losses	Claim Counts	Losses	Claim Counts
Fatal	0.5%	0.1%	12.4%	2.8%
Permanent Total	7.6%	0.1%	18.5%	0.5%
PP and TT Likely	34.8%	4.2%	58.9%	22.4%
PP and TT Not Likely	49.5%	19.2%	8.9%	9.7%
Medical Only	7.6%	76.4%	1.3%	64.6%

Average Cost Per Case Differentials

Claim Group	Singleton	Non-Singleton	Combined
Fatal	0.947	1.017	1.000
Permanent Total	0.861	1.452	1.000
PP and TT Likely	0.896	1.485	1.000
PP and TT Not Likely	0.974	2.134	1.000
Medical Only	0.995	1.221	1.000

Countrywide per Claim to per Occurrence Conversion Table

Use Linear Interpolation to get the per Occurrence Ratio

Excess Ratio	
Per Claim	Per Occurrence
1.00	1.000000
0.99	0.990032
0.98	0.980062
0.97	0.970092
0.96	0.960123
0.95	0.950155
0.94	0.940189
0.93	0.930226
0.92	0.920264
0.91	0.910305
0.90	0.900349
0.89	0.890395
0.88	0.880443
0.87	0.870494
0.86	0.860546
0.85	0.850600
0.84	0.840656
0.83	0.830714
0.82	0.820773
0.81	0.810835
0.80	0.800898
0.79	0.790962
0.78	0.781027
0.77	0.771095
0.76	0.761163
0.75	0.751234
0.74	0.741306
0.73	0.731379
0.72	0.721453
0.71	0.711530
0.70	0.701607
0.69	0.691686
0.68	0.681767
0.67	0.671849
0.66	0.661933
0.65	0.652019

Excess Ratio	
Per Claim	Per Occurrence
0.64	0.642106
0.63	0.632194
0.62	0.622285
0.61	0.612377
0.60	0.602471
0.59	0.592566
0.58	0.582664
0.57	0.572763
0.56	0.562864
0.55	0.552967
0.54	0.543071
0.53	0.533177
0.52	0.523285
0.51	0.513395
0.50	0.503507
0.49	0.493620
0.48	0.483735
0.47	0.473851
0.46	0.463970
0.45	0.454089
0.44	0.444210
0.43	0.434332
0.42	0.424456
0.41	0.414580
0.40	0.404706
0.39	0.394832
0.38	0.384958
0.37	0.375085
0.36	0.365212
0.35	0.355338
0.34	0.345464
0.33	0.335588
0.32	0.325711
0.31	0.315832
0.30	0.305951
0.29	0.296066

Excess Ratio	
Per Claim	Per Occurrence
0.28	0.286178
0.27	0.276286
0.26	0.266388
0.25	0.256485
0.24	0.246574
0.23	0.236656
0.22	0.226730
0.21	0.216794
0.20	0.206847
0.19	0.196889
0.18	0.186917
0.17	0.176933
0.16	0.166933
0.15	0.156917
0.14	0.146884
0.13	0.136833
0.12	0.126763
0.11	0.116673
0.10	0.106561
0.09	0.096426
0.08	0.086265
0.07	0.076073
0.06	0.065843
0.05	0.055563
0.04	0.045208
0.03	0.034737
0.02	0.024062
0.01	0.012971
0.005	0.007075
0.001	0.001831
0.0005	0.001051
0.0001	0.000305
0.00005	0.000181
0.00001	0.000053
0.00000	0.000000

CURVE PARAMETERS (LOSS ONLY)

State	Claim Group	Weight for Lognormal 1 w_1	Weight for Lognormal 2 w_2	Mu, Lognormal 1 μ_1	Mu, Lognormal 2 μ_2	Sigma, Lognormal 1 σ_1	Sigma, Lognormal 2 σ_2	Per Unit Increase in the Mean Excess Loss Above Splice Point *m*	Splice Point (Entry Ratio) *a*	Mean Excess Loss at Splice Point (ax+b) *b*	Probability of Exceeding Splice Point *S*	State Relativity of Variation *Rvalue*
CW	Fatal	0.657	0.343	-0.171	-2.019	0.855	1.725	0.67	5.85	4.318	0.0125575	1.000
CW	PT	0.925	0.075	-0.786	1.118	1.010	0.717	0.72	6.47	3.298	0.0151573	1.000
CW	Likely PP/TT	0.679	0.321	-1.209	-0.360	1.467	1.090	0.59	56.20	29.933	0.0001300	1.000
CW	Not Likely PP/TT	0.950	0.050	-1.174	0.236	1.517	0.509	0.47	125.00	63.963	0.0000361	1.000
CW	Med Only	0.978	0.022	-0.828	-0.892	1.217	2.218	0.96	626.00	773.489	0.0000102	1.000
AK	Fatal	0.657	0.343	-0.208	-2.137	0.893	1.801	0.67	5.85	4.650	0.0140585	1.044
AK	PT	0.925	0.075	-0.774	1.114	1.001	0.711	0.72	6.47	3.241	0.0147976	0.992
AK	Likely PP/TT	0.679	0.321	-1.145	-0.322	1.422	1.056	0.59	56.20	28.058	0.0000989	0.969
AK	Not Likely PP/TT	0.950	0.050	-1.484	0.108	1.713	0.575	0.47	125.00	84.016	0.0001089	1.129
AK	Med Only	0.978	0.022	-0.933	-1.000	1.283	2.339	0.96	626.00	917.863	0.0000159	1.055
AL	Fatal	0.657	0.343	-0.183	-2.059	0.868	1.750	0.67	5.85	4.427	0.0130660	1.015
AL	PT	0.925	0.075	-0.806	1.125	1.024	0.727	0.72	6.47	3.397	0.0157617	1.014
AL	Likely PP/TT	0.679	0.321	-1.263	-0.392	1.504	1.117	0.59	56.20	31.531	0.0001598	1.025
AL	Not Likely PP/TT	0.950	0.050	-1.398	0.145	1.661	0.558	0.47	125.00	78.346	0.0000847	1.095
AL	Med Only	0.978	0.022	-0.964	-1.033	1.303	2.374	0.96	626.00	964.081	0.0000178	1.071
AR	Fatal	0.657	0.343	-0.094	-1.753	0.768	1.548	0.67	5.85	3.641	0.0089913	0.897
AR	PT	0.925	0.075	-1.170	1.194	1.254	0.890	0.72	6.47	5.203	0.0241020	1.242
AR	Likely PP/TT	0.679	0.321	-1.056	-0.271	1.357	1.008	0.59	56.20	25.516	0.0000640	0.925
AR	Not Likely PP/TT	0.950	0.050	-1.041	0.283	1.425	0.478	0.47	125.00	55.770	0.0000181	0.939
AR	Med Only	0.978	0.022	-0.810	-0.874	1.205	2.196	0.96	626.00	750.188	0.0000094	0.990
AZ	Fatal	0.657	0.343	-0.299	-2.411	0.977	1.971	0.67	5.85	5.500	0.0171869	1.143
AZ	PT	0.925	0.075	-0.915	1.154	1.097	0.779	0.72	6.47	3.930	0.0187481	1.086
AZ	Likely PP/TT	0.679	0.321	-1.439	-0.500	1.620	1.204	0.59	56.20	36.847	0.0002781	1.105
AZ	Not Likely PP/TT	0.950	0.050	-1.071	0.273	1.446	0.485	0.47	125.00	57.615	0.0000215	0.953
AZ	Med Only	0.978	0.022	-0.762	-0.824	1.172	2.136	0.96	626.00	689.321	0.0000073	0.963
CO	Fatal	0.657	0.343	-0.118	-1.839	0.796	1.606	0.67	5.85	3.850	0.0101619	0.931
CO	PT	0.925	0.075	-0.562	1.021	0.839	0.596	0.72	6.47	2.212	0.0076395	0.831
CO	Likely PP/TT	0.679	0.321	-1.036	-0.259	1.342	0.997	0.59	56.20	24.936	0.0000573	0.915
CO	Not Likely PP/TT	0.950	0.050	-1.030	0.287	1.417	0.476	0.47	125.00	55.106	0.0000169	0.934
CO	Med Only	0.978	0.022	-0.608	-0.664	1.055	1.923	0.96	626.00	507.980	0.0000024	0.867
CT	Fatal	0.657	0.343	-0.360	-2.581	1.028	2.073	0.67	5.85	6.090	0.0188410	1.202
CT	PT	0.925	0.075	-0.958	1.163	1.125	0.799	0.72	6.47	4.145	0.0198244	1.114
CT	Likely PP/TT	0.679	0.321	-1.427	-0.493	1.613	1.198	0.59	56.20	36.488	0.0002693	1.099
CT	Not Likely PP/TT	0.950	0.050	-1.341	0.170	1.625	0.545	0.47	125.00	74.569	0.0000700	1.071
CT	Med Only	0.978	0.022	-0.725	-0.786	1.145	2.088	0.96	626.00	643.726	0.0000058	0.941
DC	Fatal	0.657	0.343	-0.182	-2.055	0.867	1.748	0.67	5.85	4.416	0.0130196	1.013
DC	PT	0.925	0.075	-0.766	1.112	0.995	0.707	0.72	6.47	3.199	0.0145358	0.986
DC	Likely PP/TT	0.679	0.321	-1.533	-0.561	1.680	1.248	0.59	56.20	39.805	0.0003537	1.145
DC	Not Likely PP/TT	0.950	0.050	-1.705	0.005	1.840	0.618	0.47	125.00	99.098	0.0001831	1.213
DC	Med Only	0.978	0.022	-0.961	-1.030	1.300	2.370	0.96	626.00	958.519	0.0000176	1.069

CURVE PARAMETERS (LOSS ONLY)

State	Claim Group	Weight for Lognormal 1 w_1	Weight for Lognormal 2 w_2	Mu, Lognormal 1 μ_1	Mu, Lognormal 2 μ_2	Sigma, Lognormal 1 σ_1	Sigma, Lognormal 2 σ_2	Per Unit Increase in the Mean Excess Loss Above Splice Point *m*	Splice Point (Entry Ratio) *a*	Mean Excess Loss at Splice Point (ax+b) *b*	Probability of Exceeding Splice Point *S*	State Relativity of Variation *Rvalue*
FL	Fatal	0.657	0.343	-0.166	-2.003	0.850	1.714	0.67	5.85	4.274	0.0123458	0.994
FL	PT	0.925	0.075	-0.662	1.071	0.919	0.653	0.72	6.47	2.695	0.0111383	0.910
FL	Likely PP/TT	0.679	0.321	-0.992	-0.234	1.309	0.972	0.59	56.20	23.686	0.0000442	0.892
FL	Not Likely PP/TT	0.950	0.050	-0.929	0.318	1.343	0.451	0.47	125.00	49.080	0.0000086	0.885
FL	Med Only	0.978	0.022	-0.795	-0.858	1.195	2.178	0.96	626.00	731.151	0.0000087	0.982
GA	Fatal	0.657	0.343	-0.079	-1.698	0.749	1.511	0.67	5.85	3.515	0.0082595	0.876
GA	PT	0.925	0.075	-0.827	1.131	1.038	0.737	0.72	6.47	3.497	0.0163564	1.028
GA	Likely PP/TT	0.679	0.321	-1.150	-0.325	1.425	1.059	0.59	56.20	28.216	0.0001014	0.972
GA	Not Likely PP/TT	0.950	0.050	-1.177	0.234	1.519	0.510	0.47	125.00	64.188	0.0000367	1.002
GA	Med Only	0.978	0.022	-0.805	-0.869	1.202	2.191	0.96	626.00	744.625	0.0000092	0.988
HI	Fatal	0.657	0.343	-0.048	-1.578	0.708	1.427	0.67	5.85	3.250	0.0066691	0.827
HI	PT	0.925	0.075	-0.566	1.023	0.843	0.598	0.72	6.47	2.231	0.0077768	0.835
HI	Likely PP/TT	0.679	0.321	-1.356	-0.449	1.567	1.164	0.59	56.20	34.336	0.0002189	1.068
HI	Not Likely PP/TT	0.950	0.050	-1.495	0.103	1.720	0.577	0.47	125.00	84.727	0.0001121	1.134
HI	Med Only	0.978	0.022	-0.857	-0.922	1.236	2.252	0.96	626.00	812.227	0.0000117	1.016
IA	Fatal	0.657	0.343	-0.140	-1.916	0.822	1.658	0.67	5.85	4.045	0.0111977	0.961
IA	PT	0.925	0.075	-0.780	1.116	1.006	0.714	0.72	6.47	3.269	0.0149789	0.996
IA	Likely PP/TT	0.679	0.321	-1.209	-0.359	1.467	1.090	0.59	56.20	29.931	0.0001300	1.000
IA	Not Likely PP/TT	0.950	0.050	-1.274	0.197	1.583	0.531	0.47	125.00	70.316	0.0000550	1.044
IA	Med Only	0.978	0.022	-0.894	-0.960	1.259	2.295	0.96	626.00	862.981	0.0000137	1.035
ID	Fatal	0.657	0.343	-0.063	-1.637	0.728	1.469	0.67	5.85	3.378	0.0074443	0.851
ID	PT	0.925	0.075	-0.898	1.150	1.086	0.771	0.72	6.47	3.847	0.0183181	1.075
ID	Likely PP/TT	0.679	0.321	-0.935	-0.203	1.265	0.939	0.59	56.20	22.095	0.0000304	0.862
ID	Not Likely PP/TT	0.950	0.050	-1.050	0.280	1.431	0.480	0.47	125.00	56.332	0.0000191	0.944
ID	Med Only	0.978	0.022	-0.726	-0.787	1.146	2.089	0.96	626.00	644.930	0.0000059	0.942
IL	Fatal	0.657	0.343	-0.321	-2.474	0.996	2.009	0.67	5.85	5.714	0.0178309	1.165
IL	PT	0.925	0.075	-0.664	1.072	0.920	0.653	0.72	6.47	2.702	0.0111901	0.911
IL	Likely PP/TT	0.679	0.321	-1.469	-0.520	1.640	1.218	0.59	56.20	37.806	0.0003020	1.118
IL	Not Likely PP/TT	0.950	0.050	-1.307	0.183	1.604	0.538	0.47	125.00	72.437	0.0000623	1.058
IL	Med Only	0.978	0.022	-0.797	-0.860	1.196	2.180	0.96	626.00	733.085	0.0000088	0.983
IN	Fatal	0.657	0.343	-0.181	-2.052	0.866	1.746	0.67	5.85	4.408	0.0129782	1.012
IN	PT	0.925	0.075	-0.822	1.130	1.035	0.735	0.72	6.47	3.475	0.0162325	1.025
IN	Likely PP/TT	0.679	0.321	-1.051	-0.268	1.354	1.005	0.59	56.20	25.376	0.0000623	0.923
IN	Not Likely PP/TT	0.950	0.050	-0.916	0.323	1.332	0.447	0.47	125.00	48.258	0.0000077	0.878
IN	Med Only	0.978	0.022	-0.877	-0.943	1.249	2.276	0.96	626.00	839.992	0.0000128	1.026
KS	Fatal	0.657	0.343	-0.059	-1.619	0.722	1.456	0.67	5.85	3.339	0.0072115	0.844
KS	PT	0.925	0.075	-0.769	1.113	0.997	0.708	0.72	6.47	3.213	0.0146214	0.988
KS	Likely PP/TT	0.679	0.321	-0.884	-0.175	1.224	0.909	0.59	56.20	20.668	0.0000208	0.834
KS	Not Likely PP/TT	0.950	0.050	-0.919	0.322	1.335	0.448	0.47	125.00	48.455	0.0000079	0.880
KS	Med Only	0.978	0.022	-0.850	-0.916	1.232	2.245	0.96	626.00	804.095	0.0000114	1.012

CURVE PARAMETERS (LOSS ONLY)

State	Claim Group	Weight for Lognormal 1 w_1	Weight for Lognormal 2 w_2	Mu, Lognormal 1 μ_1	Mu, Lognormal 2 μ_2	Sigma, Lognormal 1 σ_1	Sigma, Lognormal 2 σ_2	Per Unit Increase in the Mean Excess Loss Above Splice Point *m*	Splice Point (Entry Ratio) *a*	Mean Excess Loss at Splice Point (ax+b) *b*	Probability of Exceeding Splice Point *S*	State Relativity of Variation *Rvalue*
KY	Fatal	0.657	0.343	0.038	-1.175	0.561	1.132	0.67	5.85	2.473	0.0022859	0.656
KY	PT	0.925	0.075	-0.708	1.091	0.954	0.677	0.72	6.47	2.919	0.0126936	0.945
KY	Likely PP/TT	0.679	0.321	-1.093	-0.291	1.384	1.028	0.59	56.20	26.562	0.0000774	0.944
KY	Not Likely PP/TT	0.950	0.050	-1.136	0.250	1.491	0.501	0.47	125.00	61.625	0.0000302	0.983
KY	Med Only	0.978	0.022	-0.910	-0.977	1.269	2.314	0.96	626.00	885.571	0.0000146	1.043
LA	Fatal	0.657	0.343	-0.069	-1.658	0.735	1.483	0.67	5.85	3.424	0.0077226	0.860
LA	PT	0.925	0.075	-0.873	1.144	1.069	0.759	0.72	6.47	3.723	0.0176447	1.059
LA	Likely PP/TT	0.679	0.321	-1.239	-0.378	1.488	1.105	0.59	56.20	30.826	0.0001463	1.014
LA	Not Likely PP/TT	0.950	0.050	-1.289	0.191	1.593	0.534	0.47	125.00	71.253	0.0000582	1.050
LA	Med Only	0.978	0.022	-1.074	-1.146	1.365	2.487	0.96	626.00	1129.483	0.0000248	1.122
MD	Fatal	0.657	0.343	-0.146	-1.936	0.828	1.671	0.67	5.85	4.096	0.0114630	0.969
MD	PT	0.925	0.075	-1.062	1.182	1.190	0.845	0.72	6.47	4.663	0.0221178	1.178
MD	Likely PP/TT	0.679	0.321	-1.466	-0.518	1.638	1.217	0.59	56.20	37.697	0.0002992	1.116
MD	Not Likely PP/TT	0.950	0.050	-1.486	0.107	1.714	0.575	0.47	125.00	84.148	0.0001095	1.130
MD	Med Only	0.978	0.022	-0.708	-0.768	1.133	2.065	0.96	626.00	623.100	0.0000052	0.931
ME	Fatal	0.657	0.343	-0.074	-1.677	0.742	1.496	0.67	5.85	3.467	0.0079759	0.867
ME	PT	0.925	0.075	-0.682	1.080	0.934	0.663	0.72	6.47	2.790	0.0118102	0.925
ME	Likely PP/TT	0.679	0.321	-1.419	-0.488	1.608	1.194	0.59	56.20	36.253	0.0002636	1.096
ME	Not Likely PP/TT	0.950	0.050	-1.197	0.227	1.532	0.514	0.47	125.00	65.407	0.0000400	1.010
ME	Med Only	0.978	0.022	-0.840	-0.905	1.225	2.233	0.96	626.00	789.964	0.0000108	1.007
MO	Fatal	0.657	0.343	-0.293	-2.394	0.972	1.960	0.67	5.85	5.442	0.0170054	1.136
MO	PT	0.925	0.075	-0.790	1.120	1.013	0.719	0.72	6.47	3.318	0.0152820	1.003
MO	Likely PP/TT	0.679	0.321	-1.148	-0.323	1.424	1.058	0.59	56.20	28.148	0.0001003	0.971
MO	Not Likely PP/TT	0.950	0.050	-1.020	0.290	1.410	0.473	0.47	125.00	54.514	0.0000159	0.929
MO	Med Only	0.978	0.022	-0.781	-0.844	1.185	2.161	0.96	626.00	713.777	0.0000081	0.974
MS	Fatal	0.657	0.343	-0.249	-2.264	0.932	1.880	0.67	5.85	5.029	0.0155731	1.090
MS	PT	0.925	0.075	-1.129	1.190	1.230	0.873	0.72	6.47	4.998	0.0233916	1.218
MS	Likely PP/TT	0.679	0.321	-1.189	-0.348	1.453	1.079	0.59	56.20	29.352	0.0001199	0.991
MS	Not Likely PP/TT	0.950	0.050	-1.135	0.250	1.490	0.500	0.47	125.00	61.530	0.0000300	0.983
MS	Med Only	0.978	0.022	-1.057	-1.129	1.356	2.471	0.96	626.00	1104.103	0.0000237	1.114
MT	Fatal	0.657	0.343	-0.225	-2.191	0.910	1.835	0.67	5.85	4.807	0.0147113	1.064
MT	PT	0.925	0.075	-0.797	1.122	1.018	0.723	0.72	6.47	3.353	0.0154975	1.008
MT	Likely PP/TT	0.679	0.321	-1.008	-0.243	1.321	0.981	0.59	56.20	24.131	0.0000486	0.900
MT	Not Likely PP/TT	0.950	0.050	-1.068	0.274	1.444	0.485	0.47	125.00	57.416	0.0000211	0.952
MT	Med Only	0.978	0.022	-0.939	-1.007	1.288	2.347	0.96	626.00	927.453	0.0000163	1.058
NC	Fatal	0.657	0.343	0.013	-1.305	0.610	1.230	0.67	5.85	2.711	0.0034770	0.713
NC	PT	0.925	0.075	-0.805	1.124	1.023	0.726	0.72	6.47	3.392	0.0157343	1.013
NC	Likely PP/TT	0.679	0.321	-1.292	-0.410	1.524	1.132	0.59	56.20	32.393	0.0001771	1.039
NC	Not Likely PP/TT	0.950	0.050	-1.267	0.200	1.578	0.530	0.47	125.00	69.847	0.0000535	1.041
NC	Med Only	0.978	0.022	-0.981	-1.051	1.313	2.392	0.96	626.00	988.687	0.0000188	1.079

CURVE PARAMETERS (LOSS ONLY)

State	Claim Group	Weight for Lognormal 1 w_1	Weight for Lognormal 2 w_2	Mu, Lognormal 1 μ_1	Mu, Lognormal 2 μ_2	Sigma, Lognormal 1 σ_1	Sigma, Lognormal 2 σ_2	Per Unit Increase in the Mean Excess Loss Above Splice Point *m*	Splice Point (Entry Ratio) *a*	Mean Excess Loss at Splice Point (ax+b) *b*	Probability of Exceeding Splice Point *S*	State Relativity of Variation *Rvalue*
NE	Fatal	0.657	0.343	-0.238	-2.230	0.922	1.859	0.67	5.85	4.924	0.0151750	1.078
NE	PT	0.925	0.075	-0.448	0.947	0.740	0.525	0.72	6.47	1.673	0.0038218	0.733
NE	Likely PP/TT	0.679	0.321	-0.998	-0.238	1.313	0.976	0.59	56.20	23.863	0.0000459	0.895
NE	Not Likely PP/TT	0.950	0.050	-0.941	0.315	1.352	0.454	0.47	125.00	49.775	0.0000094	0.891
NE	Med Only	0.978	0.022	-0.996	-1.066	1.321	2.408	0.96	626.00	1010.021	0.0000197	1.086
NH	Fatal	0.657	0.343	-0.171	-2.020	0.856	1.726	0.67	5.85	4.321	0.0125703	1.000
NH	PT	0.925	0.075	-1.053	1.180	1.184	0.841	0.72	6.47	4.615	0.0219221	1.172
NH	Likely PP/TT	0.679	0.321	-1.200	-0.354	1.461	1.085	0.59	56.20	29.671	0.0001254	0.996
NH	Not Likely PP/TT	0.950	0.050	-1.283	0.193	1.589	0.533	0.47	125.00	70.860	0.0000569	1.047
NH	Med Only	0.978	0.022	-0.870	-0.936	1.244	2.268	0.96	626.00	830.103	0.0000124	1.023
NM	Fatal	0.657	0.343	-0.216	-2.164	0.901	1.818	0.67	5.85	4.729	0.0143891	1.054
NM	PT	0.925	0.075	-1.054	1.180	1.185	0.841	0.72	6.47	4.623	0.0219549	1.173
NM	Likely PP/TT	0.679	0.321	-1.049	-0.266	1.352	1.004	0.59	56.20	25.313	0.0000616	0.922
NM	Not Likely PP/TT	0.950	0.050	-1.222	0.217	1.549	0.520	0.47	125.00	66.962	0.0000445	1.021
NM	Med Only	0.978	0.022	-0.782	-0.845	1.186	2.162	0.96	626.00	714.885	0.0000081	0.975
NV	Fatal	0.657	0.343	-0.400	-2.690	1.059	2.137	0.67	5.85	6.492	0.0197646	1.239
NV	PT	0.925	0.075	-0.615	1.049	0.882	0.627	0.72	6.47	2.467	0.0095052	0.874
NV	Likely PP/TT	0.679	0.321	-1.278	-0.401	1.514	1.125	0.59	56.20	31.983	0.0001688	1.032
NV	Not Likely PP/TT	0.950	0.050	-1.141	0.248	1.494	0.502	0.47	125.00	61.898	0.0000309	0.985
NV	Med Only	0.978	0.022	-0.626	-0.682	1.069	1.949	0.96	626.00	527.609	0.0000028	0.879
OK	Fatal	0.657	0.343	-0.142	-1.924	0.824	1.663	0.67	5.85	4.065	0.0113034	0.964
OK	PT	0.925	0.075	-0.705	1.089	0.951	0.676	0.72	6.47	2.904	0.0125889	0.942
OK	Likely PP/TT	0.679	0.321	-0.989	-0.233	1.306	0.970	0.59	56.20	23.607	0.0000434	0.891
OK	Not Likely PP/TT	0.950	0.050	-1.259	0.203	1.573	0.528	0.47	125.00	69.347	0.0000519	1.037
OK	Med Only	0.978	0.022	-0.749	-0.810	1.162	2.119	0.96	626.00	672.644	0.0000067	0.955
OR	Fatal	0.657	0.343	-0.301	-2.417	0.979	1.975	0.67	5.85	5.521	0.0172517	1.145
OR	PT	0.925	0.075	-0.987	1.169	1.143	0.812	0.72	6.47	4.291	0.0205095	1.132
OR	Likely PP/TT	0.679	0.321	-1.109	-0.301	1.396	1.037	0.59	56.20	27.029	0.0000838	0.952
OR	Not Likely PP/TT	0.950	0.050	-1.199	0.226	1.534	0.515	0.47	125.00	65.529	0.0000404	1.011
OR	Med Only	0.978	0.022	-0.840	-0.904	1.225	2.232	0.96	626.00	789.469	0.0000108	1.007
RI	Fatal	0.657	0.343	-0.281	-2.358	0.961	1.938	0.67	5.85	5.326	0.0166238	1.124
RI	PT	0.925	0.075	-0.576	1.029	0.851	0.604	0.72	6.47	2.278	0.0081273	0.843
RI	Likely PP/TT	0.679	0.321	-1.370	-0.457	1.576	1.170	0.59	56.20	34.738	0.0002280	1.074
RI	Not Likely PP/TT	0.950	0.050	-1.224	0.216	1.550	0.520	0.47	125.00	67.124	0.0000450	1.022
RI	Med Only	0.978	0.022	-0.583	-0.637	1.034	1.885	0.96	626.00	480.535	0.0000019	0.850
SC	Fatal	0.657	0.343	-0.048	-1.577	0.707	1.427	0.67	5.85	3.248	0.0066613	0.827
SC	PT	0.925	0.075	-0.825	1.131	1.037	0.736	0.72	6.47	3.491	0.0163247	1.027
SC	Likely PP/TT	0.679	0.321	-1.251	-0.385	1.496	1.111	0.59	56.20	31.170	0.0001529	1.020
SC	Not Likely PP/TT	0.950	0.050	-1.101	0.262	1.468	0.492	0.47	125.00	59.478	0.0000253	0.967
SC	Med Only	0.978	0.022	-0.752	-0.813	1.164	2.123	0.96	626.00	676.259	0.0000068	0.957

CURVE PARAMETERS (LOSS ONLY)

State	Claim Group	Weight for Lognormal 1 w_1	Weight for Lognormal 2 w_2	Mu, Lognormal 1 μ_1	Mu, Lognormal 2 μ_2	Sigma, Lognormal 1 σ_1	Sigma, Lognormal 2 σ_2	Per Unit Increase in the Mean Excess Loss Above Splice Point *m*	Splice Point (Entry Ratio) *a*	Mean Excess Loss at Splice Point (ax+b) *b*	Probability of Exceeding Splice Point *S*	State Relativity of Variation *Rvalue*
SD	Fatal	0.657	0.343	-0.214	-2.158	0.899	1.814	0.67	5.85	4.711	0.0143147	1.052
SD	PT	0.925	0.075	-0.843	1.135	1.049	0.745	0.72	6.47	3.576	0.0168168	1.039
SD	Likely PP/TT	0.679	0.321	-1.005	-0.242	1.319	0.980	0.59	56.20	24.063	0.0000479	0.899
SD	Not Likely PP/TT	0.950	0.050	-0.943	0.314	1.353	0.454	0.47	125.00	49.871	0.0000095	0.892
SD	Med Only	0.978	0.022	-1.037	-1.108	1.345	2.451	0.96	626.00	1073.045	0.0000224	1.105
TN	Fatal	0.657	0.343	-0.097	-1.764	0.771	1.555	0.67	5.85	3.667	0.0091402	0.902
TN	PT	0.925	0.075	-0.936	1.159	1.111	0.789	0.72	6.47	4.036	0.0192876	1.100
TN	Likely PP/TT	0.679	0.321	-1.057	-0.271	1.358	1.009	0.59	56.20	25.544	0.0000644	0.926
TN	Not Likely PP/TT	0.950	0.050	-1.127	0.253	1.485	0.498	0.47	125.00	61.074	0.0000289	0.979
TN	Med Only	0.978	0.022	-0.760	-0.822	1.170	2.133	0.96	626.00	686.755	0.0000072	0.962
UT	Fatal	0.657	0.343	-0.163	-1.992	0.847	1.707	0.67	5.85	4.245	0.0122067	0.990
UT	PT	0.925	0.075	-0.660	1.070	0.917	0.651	0.72	6.47	2.683	0.0110537	0.908
UT	Likely PP/TT	0.679	0.321	-1.185	-0.345	1.450	1.077	0.59	56.20	29.235	0.0001179	0.989
UT	Not Likely PP/TT	0.950	0.050	-1.086	0.268	1.456	0.489	0.47	125.00	58.506	0.0000233	0.960
UT	Med Only	0.978	0.022	-0.739	-0.801	1.156	2.107	0.96	626.00	661.120	0.0000064	0.950
VA	Fatal	0.657	0.343	-0.118	-1.839	0.796	1.606	0.67	5.85	3.849	0.0101541	0.931
VA	PT	0.925	0.075	-0.944	1.160	1.116	0.792	0.72	6.47	4.074	0.0194755	1.105
VA	Likely PP/TT	0.679	0.321	-1.481	-0.528	1.647	1.224	0.59	56.20	38.175	0.0003113	1.123
VA	Not Likely PP/TT	0.950	0.050	-1.284	0.193	1.590	0.533	0.47	125.00	70.953	0.0000572	1.048
VA	Med Only	0.978	0.022	-0.968	-1.037	1.305	2.378	0.96	626.00	969.054	0.0000180	1.072
VT	Fatal	0.657	0.343	-0.227	-2.196	0.911	1.838	0.67	5.85	4.824	0.0147768	1.066
VT	PT	0.925	0.075	-0.518	0.995	0.802	0.570	0.72	6.47	2.003	0.0061129	0.795
VT	Likely PP/TT	0.679	0.321	-1.300	-0.415	1.529	1.136	0.59	56.20	32.643	0.0001823	1.043
VT	Not Likely PP/TT	0.950	0.050	-1.359	0.162	1.637	0.549	0.47	125.00	75.753	0.0000745	1.079
VT	Med Only	0.978	0.022	-0.970	-1.039	1.306	2.380	0.96	626.00	971.934	0.0000181	1.073
WV	Fatal	0.657	0.343	-0.057	-1.612	0.720	1.451	0.67	5.85	3.324	0.0071191	0.841
WV	PT	0.925	0.075	-0.640	1.061	0.902	0.641	0.72	6.47	2.588	0.0103808	0.893
WV	Likely PP/TT	0.679	0.321	-0.891	-0.179	1.230	0.913	0.59	56.20	20.871	0.0000220	0.838
WV	Not Likely PP/TT	0.950	0.050	-1.082	0.269	1.454	0.488	0.47	125.00	58.301	0.0000229	0.959
WV	Med Only	0.978	0.022	-0.699	-0.758	1.126	2.052	0.96	626.00	611.933	0.0000049	0.925

CURVE PARAMETERS (LOSS INCLUDING ALLOCATED LOSS ADJUSTMENT EXPENSE)

State	Claim Group	Weight for Lognormal 1 w_1	Weight for Lognormal 2 w_2	Mu, Lognormal 1 μ_1	Mu, Lognormal 2 μ_2	Sigma, Lognormal 1 σ_1	Sigma, Lognormal 2 σ_2	Per Unit Increase in the Mean Excess Loss Above Splice Point *m*	Splice Point (Entry Ratio) *a*	Mean Excess Loss at Splice Point (ax+b) *b*	Probability of Exceeding Splice Point *S*	State Relativity of Variation *Rvalue*
CW	Fatal	0.638	0.362	-0.186	-1.725	0.855	1.613	0.67	5.82	4.187	0.0127976	1.000
CW	PT	0.923	0.077	-0.778	1.100	1.003	0.718	0.72	6.44	3.262	0.0149892	1.000
CW	Likely PP/TT	0.939	0.061	-0.919	-0.170	1.351	0.711	0.59	56.50	26.684	0.0001160	1.000
CW	Not Likely PP/TT	0.902	0.098	-1.243	0.001	1.560	0.653	0.47	137.00	73.189	0.0000351	1.000
CW	Med Only	0.978	0.022	-0.883	-0.884	1.242	2.291	0.96	873.00	1135.112	0.0000091	1.000
AK	Fatal	0.638	0.362	-0.223	-1.832	0.893	1.685	0.67	5.82	4.521	0.0143622	1.045
AK	PT	0.923	0.077	-0.744	1.089	0.979	0.701	0.72	6.44	3.098	0.0139342	0.976
AK	Likely PP/TT	0.939	0.061	-0.922	-0.172	1.354	0.712	0.59	56.50	26.796	0.0001181	1.002
AK	Not Likely PP/TT	0.902	0.098	-1.583	-0.170	1.772	0.742	0.47	137.00	97.796	0.0001097	1.136
AK	Med Only	0.978	0.022	-0.995	-0.997	1.308	2.414	0.96	873.00	1346.574	0.0000142	1.054
AL	Fatal	0.638	0.362	-0.209	-1.792	0.879	1.658	0.67	5.82	4.394	0.0137887	1.028
AL	PT	0.923	0.077	-0.809	1.110	1.025	0.734	0.72	6.44	3.414	0.0159246	1.022
AL	Likely PP/TT	0.939	0.061	-1.008	-0.222	1.417	0.746	0.59	56.50	29.559	0.0001753	1.049
AL	Not Likely PP/TT	0.902	0.098	-1.513	-0.133	1.731	0.725	0.47	137.00	92.615	0.0000910	1.110
AL	Med Only	0.978	0.022	-1.036	-1.037	1.331	2.455	0.96	873.00	1426.290	0.0000161	1.072
AR	Fatal	0.638	0.362	-0.112	-1.499	0.770	1.453	0.67	5.82	3.540	0.0093108	0.901
AR	PT	0.923	0.077	-1.189	1.177	1.264	0.905	0.72	6.44	5.302	0.0244941	1.260
AR	Likely PP/TT	0.939	0.061	-0.774	-0.088	1.237	0.651	0.59	56.50	22.117	0.0000478	0.916
AR	Not Likely PP/TT	0.902	0.098	-1.095	0.067	1.458	0.611	0.47	137.00	63.059	0.0000167	0.935
AR	Med Only	0.978	0.022	-0.870	-0.871	1.234	2.276	0.96	873.00	1112.045	0.0000086	0.994
AZ	Fatal	0.638	0.362	-0.350	-2.165	1.008	1.901	0.67	5.82	5.675	0.0185838	1.179
AZ	PT	0.923	0.077	-0.909	1.136	1.092	0.782	0.72	6.44	3.909	0.0187033	1.089
AZ	Likely PP/TT	0.939	0.061	-1.161	-0.317	1.524	0.802	0.59	56.50	34.655	0.0003055	1.128
AZ	Not Likely PP/TT	0.902	0.098	-1.143	0.046	1.492	0.625	0.47	137.00	66.328	0.0000218	0.957
AZ	Med Only	0.978	0.022	-0.833	-0.834	1.210	2.233	0.96	873.00	1046.417	0.0000072	0.975
CO	Fatal	0.638	0.362	-0.162	-1.655	0.829	1.564	0.67	5.82	3.980	0.0117411	0.970
CO	PT	0.923	0.077	-0.546	0.999	0.825	0.591	0.72	6.44	2.140	0.0071498	0.823
CO	Likely PP/TT	0.939	0.061	-0.800	-0.103	1.259	0.662	0.59	56.50	22.945	0.0000577	0.932
CO	Not Likely PP/TT	0.902	0.098	-1.096	0.067	1.459	0.611	0.47	137.00	63.153	0.0000168	0.935
CO	Med Only	0.978	0.022	-0.661	-0.662	1.090	2.010	0.96	873.00	764.407	0.0000024	0.877
CT	Fatal	0.638	0.362	-0.374	-2.225	1.028	1.939	0.67	5.82	5.904	0.0192278	1.202
CT	PT	0.923	0.077	-0.935	1.142	1.109	0.795	0.72	6.44	4.036	0.0193552	1.106
CT	Likely PP/TT	0.939	0.061	-1.098	-0.278	1.481	0.779	0.59	56.50	32.548	0.0002483	1.096
CT	Not Likely PP/TT	0.902	0.098	-1.423	-0.087	1.676	0.702	0.47	137.00	85.977	0.0000692	1.074
CT	Med Only	0.978	0.022	-0.772	-0.773	1.170	2.158	0.96	873.00	942.952	0.0000052	0.942
DC	Fatal	0.638	0.362	-0.189	-1.733	0.858	1.618	0.67	5.82	4.213	0.0129225	1.004
DC	PT	0.923	0.077	-0.763	1.095	0.993	0.711	0.72	6.44	3.191	0.0145388	0.990
DC	Likely PP/TT	0.939	0.061	-1.235	-0.364	1.573	0.827	0.59	56.50	37.159	0.0003783	1.164
DC	Not Likely PP/TT	0.902	0.098	-1.826	-0.303	1.910	0.800	0.47	137.00	116.562	0.0001859	1.224
DC	Med Only	0.978	0.022	-1.022	-1.023	1.323	2.440	0.96	873.00	1397.998	0.0000154	1.065

CURVE PARAMETERS (LOSS INCLUDING ALLOCATED LOSS ADJUSTMENT EXPENSE)

State	Claim Group	Weight for Lognormal 1 w_1	Weight for Lognormal 2 w_2	Mu, Lognormal 1 μ_1	Mu, Lognormal 2 μ_2	Sigma, Lognormal 1 σ_1	Sigma, Lognormal 2 σ_2	Per Unit Increase in the Mean Excess Loss Above Splice Point *m*	Splice Point (Entry Ratio) *a*	Mean Excess Loss at Splice Point (ax+b) *b*	Probability of Exceeding Splice Point *S*	State Relativity of Variation *Rvalue*
FL	Fatal	0.638	0.362	-0.141	-1.592	0.806	1.520	0.67	5.82	3.797	0.0107590	0.942
FL	PT	0.923	0.077	-0.652	1.052	0.910	0.652	0.72	6.44	2.650	0.0108657	0.908
FL	Likely PP/TT	0.939	0.061	-0.739	-0.070	1.208	0.636	0.59	56.50	21.037	0.0000366	0.894
FL	Not Likely PP/TT	0.902	0.098	-1.001	0.107	1.390	0.582	0.47	137.00	56.813	0.0000092	0.891
FL	Med Only	0.978	0.022	-0.850	-0.851	1.221	2.253	0.96	873.00	1076.898	0.0000079	0.984
GA	Fatal	0.638	0.362	-0.076	-1.379	0.724	1.366	0.67	5.82	3.227	0.0074465	0.847
GA	PT	0.923	0.077	-0.814	1.111	1.028	0.737	0.72	6.44	3.440	0.0160812	1.025
GA	Likely PP/TT	0.939	0.061	-0.812	-0.109	1.268	0.667	0.59	56.50	23.293	0.0000621	0.938
GA	Not Likely PP/TT	0.902	0.098	-1.233	0.005	1.553	0.651	0.47	137.00	72.511	0.0000336	0.996
GA	Med Only	0.978	0.022	-0.867	-0.868	1.232	2.273	0.96	873.00	1106.452	0.0000085	0.992
HI	Fatal	0.638	0.362	-0.050	-1.288	0.687	1.297	0.67	5.82	3.000	0.0060710	0.804
HI	PT	0.923	0.077	-0.561	1.007	0.838	0.600	0.72	6.44	2.212	0.0076787	0.835
HI	Likely PP/TT	0.939	0.061	-1.095	-0.276	1.479	0.778	0.59	56.50	32.451	0.0002458	1.094
HI	Not Likely PP/TT	0.902	0.098	-1.607	-0.183	1.787	0.748	0.47	137.00	99.646	0.0001167	1.145
HI	Med Only	0.978	0.022	-0.944	-0.945	1.279	2.359	0.96	873.00	1248.037	0.0000118	1.030
IA	Fatal	0.638	0.362	-0.152	-1.626	0.818	1.544	0.67	5.82	3.895	0.0112948	0.958
IA	PT	0.923	0.077	-0.775	1.099	1.001	0.717	0.72	6.44	3.250	0.0149105	0.998
IA	Likely PP/TT	0.939	0.061	-0.954	-0.191	1.378	0.725	0.59	56.50	27.833	0.0001382	1.020
IA	Not Likely PP/TT	0.902	0.098	-1.366	-0.059	1.640	0.687	0.47	137.00	81.859	0.0000570	1.051
IA	Med Only	0.978	0.022	-0.950	-0.951	1.282	2.365	0.96	873.00	1258.817	0.0000120	1.032
ID	Fatal	0.638	0.362	-0.100	-1.461	0.756	1.426	0.67	5.82	3.438	0.0087117	0.884
ID	PT	0.923	0.077	-0.902	1.134	1.088	0.779	0.72	6.44	3.873	0.0185181	1.084
ID	Likely PP/TT	0.939	0.061	-0.727	-0.063	1.198	0.630	0.59	56.50	20.665	0.0000331	0.887
ID	Not Likely PP/TT	0.902	0.098	-1.123	0.055	1.478	0.619	0.47	137.00	64.964	0.0000196	0.948
ID	Med Only	0.978	0.022	-0.768	-0.769	1.167	2.152	0.96	873.00	935.012	0.0000051	0.940
IL	Fatal	0.638	0.362	-0.343	-2.148	1.002	1.891	0.67	5.82	5.612	0.0183963	1.172
IL	PT	0.923	0.077	-0.659	1.055	0.916	0.656	0.72	6.44	2.683	0.0111042	0.913
IL	Likely PP/TT	0.939	0.061	-1.090	-0.272	1.475	0.776	0.59	56.50	32.257	0.0002407	1.091
IL	Not Likely PP/TT	0.902	0.098	-1.357	-0.054	1.634	0.684	0.47	137.00	81.218	0.0000552	1.048
IL	Med Only	0.978	0.022	-0.843	-0.844	1.216	2.244	0.96	873.00	1063.334	0.0000076	0.980
IN	Fatal	0.638	0.362	-0.187	-1.730	0.856	1.616	0.67	5.82	4.201	0.0128668	1.002
IN	PT	0.923	0.077	-0.829	1.116	1.039	0.744	0.72	6.44	3.514	0.0165208	1.036
IN	Likely PP/TT	0.939	0.061	-0.777	-0.090	1.240	0.652	0.59	56.50	22.220	0.0000490	0.918
IN	Not Likely PP/TT	0.902	0.098	-0.971	0.119	1.367	0.573	0.47	137.00	54.834	0.0000074	0.877
IN	Med Only	0.978	0.022	-0.920	-0.921	1.265	2.333	0.96	873.00	1203.582	0.0000107	1.018
KS	Fatal	0.638	0.362	-0.077	-1.384	0.726	1.369	0.67	5.82	3.238	0.0075137	0.849
KS	PT	0.923	0.077	-0.764	1.096	0.993	0.712	0.72	6.44	3.196	0.0145678	0.990
KS	Likely PP/TT	0.939	0.061	-0.652	-0.024	1.132	0.596	0.59	56.50	18.353	0.0000163	0.838
KS	Not Likely PP/TT	0.902	0.098	-0.981	0.115	1.375	0.576	0.47	137.00	55.468	0.0000080	0.881
KS	Med Only	0.978	0.022	-0.908	-0.909	1.257	2.319	0.96	873.00	1180.707	0.0000102	1.012

CURVE PARAMETERS (LOSS INCLUDING ALLOCATED LOSS ADJUSTMENT EXPENSE)

State	Claim Group	Weight for Lognormal 1 w_1	Weight for Lognormal 2 w_2	Mu, Lognormal 1 μ_1	Mu, Lognormal 2 μ_2	Sigma, Lognormal 1 σ_1	Sigma, Lognormal 2 σ_2	Per Unit Increase in the Mean Excess Loss Above Splice Point *m*	Splice Point (Entry Ratio) *a*	Mean Excess Loss at Splice Point (ax+b) *b*	Probability of Exceeding Splice Point *S*	State Relativity of Variation *Rvalue*
KY	Fatal	0.638	0.362	0.017	-1.016	0.573	1.082	0.67	5.82	2.378	0.0026070	0.671
KY	PT	0.923	0.077	-0.698	1.072	0.946	0.677	0.72	6.44	2.876	0.0124471	0.943
KY	Likely PP/TT	0.939	0.061	-0.795	-0.100	1.254	0.660	0.59	56.50	22.772	0.0000555	0.928
KY	Not Likely PP/TT	0.902	0.098	-1.154	0.041	1.499	0.628	0.47	137.00	67.056	0.0000230	0.961
KY	Med Only	0.978	0.022	-0.925	-0.926	1.267	2.338	0.96	873.00	1212.235	0.0000109	1.021
LA	Fatal	0.638	0.362	-0.061	-1.329	0.704	1.328	0.67	5.82	3.100	0.0066784	0.823
LA	PT	0.923	0.077	-0.858	1.123	1.059	0.758	0.72	6.44	3.657	0.0173381	1.055
LA	Likely PP/TT	0.939	0.061	-0.908	-0.164	1.343	0.707	0.59	56.50	26.344	0.0001097	0.994
LA	Not Likely PP/TT	0.902	0.098	-1.371	-0.061	1.643	0.688	0.47	137.00	82.215	0.0000580	1.053
LA	Med Only	0.978	0.022	-1.184	-1.186	1.407	2.595	0.96	873.00	1734.152	0.0000239	1.133
MD	Fatal	0.638	0.362	-0.174	-1.692	0.843	1.589	0.67	5.82	4.087	0.0122938	0.986
MD	PT	0.923	0.077	-1.064	1.164	1.190	0.852	0.72	6.44	4.679	0.0222476	1.187
MD	Likely PP/TT	0.939	0.061	-1.151	-0.310	1.517	0.798	0.59	56.50	34.312	0.0002959	1.123
MD	Not Likely PP/TT	0.902	0.098	-1.598	-0.178	1.781	0.746	0.47	137.00	98.937	0.0001140	1.142
MD	Med Only	0.978	0.022	-0.763	-0.764	1.163	2.146	0.96	873.00	926.989	0.0000049	0.937
ME	Fatal	0.638	0.362	-0.097	-1.450	0.752	1.418	0.67	5.82	3.410	0.0085471	0.879
ME	PT	0.923	0.077	-0.680	1.064	0.932	0.667	0.72	6.44	2.785	0.0118218	0.929
ME	Likely PP/TT	0.939	0.061	-1.118	-0.290	1.495	0.786	0.59	56.50	33.211	0.0002658	1.106
ME	Not Likely PP/TT	0.902	0.098	-1.258	-0.006	1.570	0.657	0.47	137.00	74.229	0.0000374	1.006
ME	Med Only	0.978	0.022	-0.887	-0.888	1.244	2.296	0.96	873.00	1142.478	0.0000093	1.002
MO	Fatal	0.638	0.362	-0.288	-2.006	0.954	1.800	0.67	5.82	5.099	0.0166971	1.116
MO	PT	0.923	0.077	-0.794	1.105	1.015	0.727	0.72	6.44	3.342	0.0154837	1.011
MO	Likely PP/TT	0.939	0.061	-0.805	-0.105	1.262	0.664	0.59	56.50	23.081	0.0000594	0.934
MO	Not Likely PP/TT	0.902	0.098	-1.048	0.088	1.424	0.596	0.47	137.00	59.878	0.0000125	0.913
MO	Med Only	0.978	0.022	-0.832	-0.833	1.210	2.232	0.96	873.00	1044.977	0.0000072	0.974
MS	Fatal	0.638	0.362	-0.221	-1.827	0.891	1.682	0.67	5.82	4.504	0.0142894	1.043
MS	PT	0.923	0.077	-1.013	1.156	1.159	0.830	0.72	6.44	4.424	0.0211761	1.155
MS	Likely PP/TT	0.939	0.061	-0.892	-0.154	1.331	0.700	0.59	56.50	25.821	0.0001006	0.985
MS	Not Likely PP/TT	0.902	0.098	-1.223	0.010	1.546	0.648	0.47	137.00	71.793	0.0000321	0.991
MS	Med Only	0.978	0.022	-1.161	-1.162	1.395	2.574	0.96	873.00	1683.455	0.0000226	1.124
MT	Fatal	0.638	0.362	-0.271	-1.963	0.939	1.772	0.67	5.82	4.952	0.0161447	1.099
MT	PT	0.923	0.077	-0.807	1.109	1.024	0.733	0.72	6.44	3.405	0.0158693	1.020
MT	Likely PP/TT	0.939	0.061	-0.834	-0.121	1.286	0.676	0.59	56.50	23.989	0.0000717	0.951
MT	Not Likely PP/TT	0.902	0.098	-1.121	0.056	1.477	0.618	0.47	137.00	64.817	0.0000193	0.947
MT	Med Only	0.978	0.022	-0.957	-0.959	1.287	2.373	0.96	873.00	1273.461	0.0000124	1.036
NC	Fatal	0.638	0.362	0.001	-1.086	0.604	1.139	0.67	5.82	2.535	0.0033875	0.706
NC	PT	0.923	0.077	-0.814	1.111	1.029	0.737	0.72	6.44	3.441	0.0160886	1.025
NC	Likely PP/TT	0.939	0.061	-1.002	-0.219	1.413	0.743	0.59	56.50	29.375	0.0001711	1.046
NC	Not Likely PP/TT	0.902	0.098	-1.329	-0.041	1.617	0.677	0.47	137.00	79.275	0.0000499	1.036
NC	Med Only	0.978	0.022	-1.041	-1.042	1.334	2.460	0.96	873.00	1436.434	0.0000164	1.074

CURVE PARAMETERS (LOSS INCLUDING ALLOCATED LOSS ADJUSTMENT EXPENSE)

State	Claim Group	Weight for Lognormal 1 w_1	Weight for Lognormal 2 w_2	Mu, Lognormal 1 μ_1	Mu, Lognormal 2 μ_2	Sigma, Lognormal 1 σ_1	Sigma, Lognormal 2 σ_2	Per Unit Increase in the Mean Excess Loss Above Splice Point *m*	Splice Point (Entry Ratio) *a*	Mean Excess Loss at Splice Point (ax+b) *b*	Probability of Exceeding Splice Point *S*	State Relativity of Variation *Rvalue*
NE	Fatal	0.638	0.362	-0.285	-1.998	0.951	1.795	0.67	5.82	5.074	0.0166025	1.113
NE	PT	0.923	0.077	-0.448	0.935	0.739	0.529	0.72	6.44	1.677	0.0038732	0.737
NE	Likely PP/TT	0.939	0.061	-0.747	-0.074	1.214	0.639	0.59	56.50	21.268	0.0000388	0.899
NE	Not Likely PP/TT	0.902	0.098	-1.007	0.104	1.395	0.584	0.47	137.00	57.215	0.0000096	0.894
NE	Med Only	0.978	0.022	-1.063	-1.064	1.345	2.482	0.96	873.00	1480.670	0.0000175	1.083
NH	Fatal	0.638	0.362	-0.199	-1.765	0.869	1.640	0.67	5.82	4.309	0.0133882	1.017
NH	PT	0.923	0.077	-1.051	1.162	1.182	0.847	0.72	6.44	4.611	0.0219728	1.178
NH	Likely PP/TT	0.939	0.061	-0.961	-0.195	1.383	0.728	0.59	56.50	28.041	0.0001425	1.023
NH	Not Likely PP/TT	0.902	0.098	-1.369	-0.060	1.642	0.687	0.47	137.00	82.070	0.0000576	1.052
NH	Med Only	0.978	0.022	-0.892	-0.893	1.248	2.301	0.96	873.00	1151.900	0.0000095	1.005
NM	Fatal	0.638	0.362	-0.258	-1.927	0.927	1.748	0.67	5.82	4.832	0.0156751	1.084
NM	PT	0.923	0.077	-1.060	1.163	1.188	0.851	0.72	6.44	4.658	0.0221632	1.184
NM	Likely PP/TT	0.939	0.061	-0.861	-0.137	1.307	0.688	0.59	56.50	24.850	0.0000846	0.967
NM	Not Likely PP/TT	0.902	0.098	-1.302	-0.027	1.599	0.669	0.47	137.00	77.310	0.0000448	1.025
NM	Med Only	0.978	0.022	-0.824	-0.825	1.205	2.222	0.96	873.00	1031.032	0.0000069	0.970
NV	Fatal	0.638	0.362	-0.436	-2.374	1.076	2.030	0.67	5.82	6.495	0.0206439	1.259
NV	PT	0.923	0.077	-0.615	1.035	0.882	0.632	0.72	6.44	2.472	0.0095882	0.879
NV	Likely PP/TT	0.939	0.061	-1.022	-0.231	1.427	0.751	0.59	56.50	30.039	0.0001863	1.056
NV	Not Likely PP/TT	0.902	0.098	-1.201	0.020	1.532	0.642	0.47	137.00	70.298	0.0000290	0.982
NV	Med Only	0.978	0.022	-0.664	-0.665	1.092	2.014	0.96	873.00	768.924	0.0000024	0.879
OK	Fatal	0.638	0.362	-0.169	-1.675	0.837	1.578	0.67	5.82	4.038	0.0120431	0.979
OK	PT	0.923	0.077	-0.703	1.073	0.949	0.680	0.72	6.44	2.896	0.0125861	0.946
OK	Likely PP/TT	0.939	0.061	-0.737	-0.069	1.207	0.635	0.59	56.50	20.985	0.0000361	0.893
OK	Not Likely PP/TT	0.902	0.098	-1.331	-0.041	1.617	0.677	0.47	137.00	79.367	0.0000501	1.037
OK	Med Only	0.978	0.022	-0.799	-0.800	1.188	2.191	0.96	873.00	987.438	0.0000060	0.957
OR	Fatal	0.638	0.362	-0.381	-2.243	1.033	1.950	0.67	5.82	5.971	0.0194045	1.209
OR	PT	0.923	0.077	-0.982	1.151	1.139	0.816	0.72	6.44	4.271	0.0204848	1.136
OR	Likely PP/TT	0.939	0.061	-0.876	-0.145	1.318	0.694	0.59	56.50	25.311	0.0000920	0.976
OR	Not Likely PP/TT	0.902	0.098	-1.281	-0.017	1.585	0.664	0.47	137.00	75.841	0.0000412	1.016
OR	Med Only	0.978	0.022	-0.912	-0.913	1.259	2.323	0.96	873.00	1187.746	0.0000103	1.014
RI	Fatal	0.638	0.362	-0.259	-1.929	0.927	1.750	0.67	5.82	4.838	0.0157013	1.085
RI	PT	0.923	0.077	-0.581	1.018	0.854	0.612	0.72	6.44	2.309	0.0083927	0.852
RI	Likely PP/TT	0.939	0.061	-1.121	-0.292	1.497	0.788	0.59	56.50	33.313	0.0002686	1.108
RI	Not Likely PP/TT	0.902	0.098	-1.311	-0.032	1.605	0.672	0.47	137.00	77.996	0.0000466	1.029
RI	Med Only	0.978	0.022	-0.599	-0.600	1.041	1.920	0.96	873.00	671.685	0.0000014	0.838
SC	Fatal	0.638	0.362	-0.053	-1.301	0.693	1.307	0.67	5.82	3.033	0.0062700	0.810
SC	PT	0.923	0.077	-0.784	1.102	1.008	0.722	0.72	6.44	3.294	0.0151882	1.005
SC	Likely PP/TT	0.939	0.061	-0.938	-0.181	1.366	0.719	0.59	56.50	27.298	0.0001276	1.011
SC	Not Likely PP/TT	0.902	0.098	-1.131	0.052	1.483	0.621	0.47	137.00	65.488	0.0000204	0.951
SC	Med Only	0.978	0.022	-0.814	-0.815	1.198	2.210	0.96	873.00	1013.968	0.0000066	0.965

CURVE PARAMETERS (LOSS INCLUDING ALLOCATED LOSS ADJUSTMENT EXPENSE)

State	Claim Group	Weight for Lognormal 1 w_1	Weight for Lognormal 2 w_2	Mu, Lognormal 1 μ_1	Mu, Lognormal 2 μ_2	Sigma, Lognormal 1 σ_1	Sigma, Lognormal 2 σ_2	Per Unit Increase in the Mean Excess Loss Above Splice Point *m*	Splice Point (Entry Ratio) *a*	Mean Excess Loss at Splice Point (ax+b) *b*	Probability of Exceeding Splice Point *S*	State Relativity of Variation *Rvalue*
SD	Fatal	0.638	0.362	-0.239	-1.877	0.909	1.715	0.67	5.82	4.665	0.0149894	1.064
SD	PT	0.923	0.077	-0.828	1.115	1.038	0.744	0.72	6.44	3.510	0.0164958	1.035
SD	Likely PP/TT	0.939	0.061	-0.827	-0.117	1.280	0.674	0.59	56.50	23.769	0.0000686	0.947
SD	Not Likely PP/TT	0.902	0.098	-1.021	0.099	1.405	0.588	0.47	137.00	58.119	0.0000105	0.900
SD	Med Only	0.978	0.022	-1.115	-1.116	1.372	2.532	0.96	873.00	1587.013	0.0000202	1.105
TN	Fatal	0.638	0.362	-0.098	-1.455	0.753	1.421	0.67	5.82	3.422	0.0086149	0.881
TN	PT	0.923	0.077	-0.921	1.139	1.100	0.788	0.72	6.44	3.969	0.0190159	1.097
TN	Likely PP/TT	0.939	0.061	-0.824	-0.116	1.277	0.672	0.59	56.50	23.668	0.0000672	0.945
TN	Not Likely PP/TT	0.902	0.098	-1.190	0.025	1.524	0.638	0.47	137.00	69.538	0.0000276	0.977
TN	Med Only	0.978	0.022	-0.813	-0.814	1.197	2.209	0.96	873.00	1011.997	0.0000065	0.964
UT	Fatal	0.638	0.362	-0.207	-1.786	0.877	1.654	0.67	5.82	4.374	0.0136932	1.026
UT	PT	0.923	0.077	-0.658	1.055	0.915	0.656	0.72	6.44	2.680	0.0110832	0.912
UT	Likely PP/TT	0.939	0.061	-0.949	-0.187	1.374	0.723	0.59	56.50	27.645	0.0001345	1.017
UT	Not Likely PP/TT	0.902	0.098	-1.154	0.041	1.499	0.628	0.47	137.00	67.048	0.0000230	0.961
UT	Med Only	0.978	0.022	-0.805	-0.806	1.192	2.199	0.96	873.00	998.827	0.0000063	0.960
VA	Fatal	0.638	0.362	-0.115	-1.510	0.774	1.461	0.67	5.82	3.569	0.0094746	0.906
VA	PT	0.923	0.077	-0.960	1.147	1.125	0.806	0.72	6.44	4.161	0.0199658	1.122
VA	Likely PP/TT	0.939	0.061	-1.183	-0.330	1.538	0.809	0.59	56.50	35.370	0.0003258	1.138
VA	Not Likely PP/TT	0.902	0.098	-1.346	-0.049	1.627	0.682	0.47	137.00	80.480	0.0000531	1.043
VA	Med Only	0.978	0.022	-1.021	-1.022	1.322	2.439	0.96	873.00	1396.049	0.0000154	1.065
VT	Fatal	0.638	0.362	-0.241	-1.881	0.911	1.718	0.67	5.82	4.680	0.0150505	1.065
VT	PT	0.923	0.077	-0.511	0.978	0.795	0.570	0.72	6.44	1.974	0.0059388	0.793
VT	Likely PP/TT	0.939	0.061	-1.100	-0.279	1.482	0.780	0.59	56.50	32.595	0.0002495	1.097
VT	Not Likely PP/TT	0.902	0.098	-1.436	-0.094	1.684	0.705	0.47	137.00	86.965	0.0000723	1.080
VT	Med Only	0.978	0.022	-1.012	-1.013	1.318	2.431	0.96	873.00	1379.242	0.0000150	1.061
WV	Fatal	0.638	0.362	-0.072	-1.367	0.719	1.357	0.67	5.82	3.197	0.0072660	0.841
WV	PT	0.923	0.077	-0.633	1.044	0.896	0.642	0.72	6.44	2.561	0.0102308	0.893
WV	Likely PP/TT	0.939	0.061	-0.652	-0.025	1.133	0.596	0.59	56.50	18.374	0.0000165	0.838
WV	Not Likely PP/TT	0.902	0.098	-1.148	0.044	1.495	0.626	0.47	137.00	66.647	0.0000223	0.959
WV	Med Only	0.978	0.022	-0.742	-0.743	1.149	2.120	0.96	873.00	893.360	0.0000043	0.925

SAMPLE CALCULATIONS AND TEST VALUES FOR LOSS ONLY EXCESS RATIOS

From Exhibit IV

State	Claim Group	w_1	w_2	μ_1	μ_2	σ_1	σ_2	m	a	b	S
CW	Fatal	0.657	0.343	-0.171	-2.019	0.855	1.725	0.67	5.85	4.318	0.0125575
CW	PT	0.925	0.076	-0.786	1.118	1.010	0.717	0.72	6.47	3.298	0.0151573
CW	Likely PP/TT	0.679	0.321	-1.209	-0.360	1.467	1.090	0.59	56.20	29.933	0.0001300
CW	Not Likely PP/TT	0.950	0.050	-1.174	0.236	1.517	0.509	0.47	125.00	63.963	0.0000361
CW	Med Only	0.978	0.022	-0.828	-0.892	1.217	2.218	0.96	626.00	773.489	0.0000102

Hypothetical Values from Loss Only *Excess Loss Factor Calculations* - Hazard Group X

Claim Group	Total Loss	Claim Count	Average Cost Per Case	Claim Group Loss Weight	Claim Group Claim Count Weight	UP (Loss Only)
Fatal	2,384,961	7.1216	334,890.20	0.01578	0.00081	335,056.14
PT	12,414,792	6.5941	1,882,718.57	0.08216	0.00075	1,891,909.40
Likely PP/TT	51,037,027	383.6200	133,040.58	0.33775	0.04388	133,058.40
Not Likely PP/TT	75,299,859	1,885.6800	39,932.47	0.49831	0.21569	39,933.28
Med Only	9,974,373	6,459.7200	1,544.09	0.06601	0.73887	1,544.35
Overall	151,111,011	8,743	17,284.18	1.00000	1.00000	N/A

Rounded values are shown in calculation, calculation results are based on unrounded values

Calculate the Claim Group (Fatal) Per Claim Excess Ratio at a $250,000 loss limit

1) Calculate the Percentage of Loss Distribution Limited to $250,000, R(250,000), by Claim Group (Fatal)

Because $\frac{250,000}{335,057.28}$ is less than splice point 5.85 use the lognormal formula below for R(x). Otherwise use the Pareto Formula

$$R_{Fatal}(250{,}000; UP_{Loss}, Loss) = .657 \cdot \left[e^{-.171+\frac{.855^2}{2}} \Phi\left(\frac{\ln \frac{250,000}{335,057.28} - (-.171) - .855^2}{.855} \right) + \frac{250,000}{335,057.28} \left[1 - \Phi\left(\frac{\ln \frac{250,000}{335,057.28} - (-.171)}{.855} \right) \right] \right]$$
$$+ .343 \cdot \left[e^{-2.019+\frac{1.725^2}{2}} \Phi\left(\frac{\ln \frac{250,000}{335,057.28} - (-2.019) - 1.725^2}{1.725} \right) + \frac{250,000}{335,057.28} \left[1 - \Phi\left(\frac{\ln \frac{250,000}{335,057.28} - (-2.019)}{1.725} \right) \right] \right]$$

$R_{Fatal}(250{,}000; UP_{Loss}, Loss) = .487801352$

2) Calculate the Average Severity Limited to 250,000

$E_{Fatal}[Min(X; 250{,}000)] = 335{,}057.28 \cdot .487801352 = 163{,}441.39$

3) Find the Excess Ratio = 1 - Average Severity Limited to 250,000 / Average Cost Per Case

$E_{Fatal}(250{,}000) = 1 - \frac{163,441.39}{334,890.20} = .5120$ $(matches\ to\ Fatal\ at\ 250{,}000\ in\ table\ below)$

SAMPLE CALCULATIONS AND TEST VALUES FOR LOSS ONLY EXCESS RATIOS

Calculate the Overall Per Claim Excess Ratio

$$E_{PerClaim}\,(250{,}000) = .5120 \cdot .0158 + .8718 \cdot .0822 + .3357 \cdot .3377 + .1568 \cdot .4983 + .0203 \cdot .0660 = .2726\ (matches\ to\ Per\ Claim\ at\ 250{,}000\ in\ table\ below)$$

Determine the Overall Per Occurrence Excess Ratio using linear interpolation

From Exhibit III

Per Claim	Per Occurrence
0.28	0.286178
0.27	0.276286

$$E_{PerOccurrence}(250{,}000) = .276286 + \frac{.286178 - .276286}{.28 - .27}(.2726 - .27) = .2788$$

$$Matches\ to\ Per\ Occurrence\ at\ 250{,}000\ in\ table\ below$$

Calculated Excess Ratios Corresponding to *Excess Loss Factor Calculations Exhibit IX*

Limit (x)	Fatal	Permanent Total	PP and TT Likely	PP and TT Not Likely	Medical Only	Per Claim	Per Occurrence
10,000	0.9712	0.9947	0.9291	0.8100	0.1291	0.8230	0.8238
15,000	0.9574	0.9920	0.8974	0.7445	0.0956	0.7770	0.7781
20,000	0.9440	0.9894	0.8679	0.6896	0.0787	0.7382	0.7395
25,000	0.9308	0.9867	0.8404	0.6425	0.0686	0.7043	0.7059
30,000	0.9179	0.9841	0.8146	0.6014	0.0618	0.6742	0.6761
35,000	0.9053	0.9814	0.7904	0.5652	0.0568	0.6473	0.6493
40,000	0.8928	0.9788	0.7676	0.5331	0.0530	0.6229	0.6252
50,000	0.8684	0.9735	0.7258	0.4788	0.0473	0.5805	0.5832
75,000	0.8104	0.9602	0.6384	0.3822	0.0388	0.5003	0.5038
100,000	0.7567	0.9471	0.5691	0.3187	0.0337	0.4430	0.4472
200,000	0.5803	0.8961	0.3913	0.1903	0.0232	0.3113	0.3171
250,000	0.5120	0.8718	0.3357	0.1568	0.0203	0.2726	0.2788
300,000	0.4542	0.8484	0.2925	0.1324	0.0181	0.2428	0.2494
400,000	0.3632	0.8044	0.2297	0.0992	0.0150	0.1998	0.2067
500,000	0.2962	0.7641	0.1866	0.0779	0.0129	0.1701	0.1770
600,000	0.2458	0.7270	0.1554	0.0631	0.0113	0.1483	0.1552
700,000	0.2072	0.6931	0.1318	0.0524	0.0100	0.1315	0.1383
800,000	0.1770	0.6618	0.1136	0.0443	0.0090	0.1182	0.1249
900,000	0.1531	0.6330	0.0991	0.0380	0.0082	0.1073	0.1140
1,000,000	0.1338	0.6063	0.0873	0.0329	0.0075	0.0983	0.1049
2,000,000	0.0523	0.4194	0.0346	0.0118	0.0040	0.0531	0.0587
3,000,000	0.0297	0.3111	0.0187	0.0059	0.0027	0.0355	0.0405
4,000,000	0.0196	0.2395	0.0117	0.0035	0.0020	0.0258	0.0303
5,000,000	0.0141	0.1887	0.0079	0.0023	0.0016	0.0196	0.0237
6,000,000	0.0107	0.1510	0.0057	0.0016	0.0013	0.0154	0.0189
7,000,000	0.0085	0.1223	0.0043	0.0012	0.0011	0.0123	0.0155
8,000,000	0.0069	0.0999	0.0033	0.0009	0.0009	0.0099	0.0129
9,000,000	0.0057	0.0822	0.0026	0.0007	0.0008	0.0081	0.0108
10,000,000	0.0049	0.0681	0.0021	0.0006	0.0007	0.0067	0.0091

SAMPLE CALCULATIONS AND TEST VALUES FOR LOSS INCLUDING ALLOCATED LOSS ADJUSTMENT EXPENSE EXCESS RATIOS

From Exhibit V

State	Claim Group	w_1	w_2	μ_1	μ_2	σ_1	σ_2	m	a	b	S
CW	Fatal	0.638	0.362	-0.186	-1.725	0.855	1.613	0.67	5.82	4.187	0.0127976
CW	PT	0.923	0.077	-0.778	1.100	1.003	0.718	0.72	6.44	3.262	0.0149892
CW	Likely PP/TT	0.939	0.061	-0.919	-0.170	1.351	0.711	0.59	56.50	26.684	0.0001160
CW	Not Likely PP/TT	0.902	0.098	-1.243	0.001	1.560	0.653	0.47	137.00	73.189	0.0000351
CW	Med Only	0.978	0.022	-0.883	-0.884	1.242	2.291	0.96	873.00	1135.113	0.0000091

Hypothetical Values from Loss Including Allocated Loss Adjustment Expense *Excess Loss Factor Calculations* - Hazard Group X

Claim Group	Total Loss	Claim Count	Average Cost Per Case	Claim Group Loss Weight	Claim Group Claim Count Weight	UP (ALAE)
Fatal	2,533,332	7.1216	355,724.08	0.01498	0.00081	355,906.40
PT	13,473,014	6.5941	2,043,199.24	0.07964	0.00075	2,054,089.35
Likely PP/TT	57,509,094	383.6200	149,911.62	0.33996	0.04388	149,929.44
Not Likely PP/TT	84,304,405	1,885.6800	44,707.69	0.49836	0.21569	44,709.37
Med Only	11,345,463	6,459.7200	1,756.34	0.06707	0.73887	1,757.00
Per Claim	169,165,308	8,743	19,349.24	1.00000	1.00000	N/A

Rounded values are shown in calculation, calculation results are based on unrounded values

Calculate the Claim Group (Fatal) Per Claim Excess Ratio at a $250,000 loss limit

1) Calculate the Percentage of Loss Distribution Limited to $250,000, R(250,000), by Claim Group (Fatal)

Because $\frac{250,000}{335,057.28}$ is less than splice point 5.82 use the lognormal formula below for R(x). Otherwise use the Pareto Formula

$$R_{Fatal}(250{,}000; UP_{ALAE}, Loss) = .657 \cdot \left[e^{-.171+\frac{.855^2}{2}} \Phi\left(\frac{\ln \frac{250,000}{355,906.40} - (-.171) - .855^2}{.855} \right) + \frac{250,000}{355,906.40} \left[1 - \Phi\left(\frac{\ln \frac{250,000}{355,906.40} - (-.171)}{.855} \right) \right] \right]$$
$$+ .343 \cdot \left[e^{-2.019+\frac{1.725^2}{2}} \Phi\left(\frac{\ln \frac{250,000}{355,906.40} - (-2.019) - 1.725^2}{1.725} \right) + \frac{250,000}{355,906.40} \left[1 - \Phi\left(\frac{\ln \frac{250,000}{355,906.40} - (-2.019)}{1.725} \right) \right] \right]$$

$$R_{Fatal}(250{,}000; UP_{ALAE}, ALAE) = .6375 \cdot \left[e^{-.186+\frac{.855^2}{2}} \Phi\left(\frac{\ln \frac{250,000}{355,906.40} - (-.186) - .855^2}{.855} \right) + \frac{250,000}{355,906.40} \left[1 - \Phi\left(\frac{\ln \frac{250,000}{355,906.40} - (-.186)}{.855} \right) \right] \right]$$
$$+ .3625 \cdot \left[e^{-1.7251+\frac{1.613^2}{2}} \Phi\left(\frac{\ln \frac{250,000}{355,906.40} - (-1.725) - 1.613^2}{1.6125} \right) + \frac{250,000}{355,906.40} \left[1 - \Phi\left(\frac{\ln \frac{250,000}{355,906.40} - (-1.725)}{1.6125} \right) \right] \right]$$

SAMPLE CALCULATIONS AND TEST VALUES FOR LOSS INCLUDING ALLOCATED LOSS ADJUSTMENT EXPENSE EXCESS RATIOS

$R_{Fatal}(250{,}000; UP_{ALAE}, Loss) =$ .4689802

$R_{Fatal}(250{,}000; UP_{ALAE}, ALAE) =$ .4737705

2) Calculate the Average Severity Limited to 250,000

$$E_{Fatal}[Min(X; 250{,}000)] = 355{,}906.40 \cdot \left[.4689802 + \frac{1.132 - 1}{1.132 - 1}(.4737705 - .4689802)\right] = 168{,}617.97$$

$Floor = 163{,}441.39$ (from Step 2 of Exhibit VI)

Ceiling = 163,441.39 + 355,906.40 (UP Parameter including ALAE) - 335,057.28 (UP Parameter Loss Only) = 184,290.51

3) Find the Excess Ratio = 1 - Average Severity Limited to 250,000 / Average Cost Per Case

$$E_{Fatal}\,(250{,}000) = 1 - \frac{168{,}617.97}{355{,}724.08} = .5260\ (matches\ to\ Fatal\ at\ 250{,}000\ in\ table\ below)$$

SAMPLE CALCULATIONS AND TEST VALUES FOR LOSS INCLUDING ALLOCATED LOSS ADJUSTMENT EXPENSE EXCESS RATIOS

Calculate the Overall Per Claim Excess Ratio

$E_{PerClaim}\,(250{,}000) = .5260 \cdot .0150 + .8811 \cdot .0796 + .3569 \cdot .3400 + .1780 \cdot .4984 + .0327 \cdot .0671 = .2903$ $(matches\ to\ Per\ Claim\ at\ 250{,}000\ in\ table\ below)$

Determine the Overall Per Occurrence Excess Ratio using linear interpolation

From Exhibit III

Per Claim	Per Occurrence
0.30	0.305951
0.29	0.296066

$E_{PerOccurrence}(250{,}000) = .296066 + \frac{.305951 - .296066}{.30 - .29}(.29025 - .29) = .2963$

$Matches\ to\ Per\ Occurrence\ at\ 250{,}000\ in\ table\ below$

Calculated Excess Ratios Corresponding to *Excess Loss Factor Calculations Exhibit X*

Limit (x)	Fatal	Permanent Total	PP and TT Likely	PP and TT Not Likely	Medical Only	Per Claim	Per Occurrence
10,000	0.9725	0.9951	0.9356	0.8269	0.1649	0.8350	0.8357
15,000	0.9592	0.9927	0.9061	0.7648	0.1263	0.7911	0.7920
20,000	0.9463	0.9902	0.8785	0.7119	0.1063	0.7536	0.7548
25,000	0.9335	0.9878	0.8525	0.6661	0.0940	0.7207	0.7221
30,000	0.9210	0.9853	0.8280	0.6259	0.0856	0.6914	0.6931
35,000	0.9088	0.9829	0.8049	0.5904	0.0795	0.6651	0.6670
40,000	0.8967	0.9804	0.7830	0.5588	0.0747	0.6412	0.6433
50,000	0.8730	0.9755	0.7427	0.5051	0.0677	0.5995	0.6020
75,000	0.8169	0.9633	0.6575	0.4085	0.0569	0.5199	0.5232
100,000	0.7649	0.9512	0.5893	0.3442	0.0504	0.4625	0.4664
200,000	0.5931	0.9038	0.4126	0.2126	0.0366	0.3296	0.3351
250,000	0.5260	0.8811	0.3569	0.1780	0.0327	0.2903	0.2963
300,000	0.4688	0.8591	0.3134	0.1524	0.0297	0.2599	0.2663
400,000	0.3781	0.8174	0.2498	0.1171	0.0252	0.2157	0.2225
500,000	0.3106	0.7789	0.2056	0.0939	0.0221	0.1849	0.1918
600,000	0.2593	0.7433	0.1731	0.0775	0.0197	0.1619	0.1688
700,000	0.2196	0.7104	0.1483	0.0654	0.0178	0.1441	0.1510
800,000	0.1884	0.6799	0.1288	0.0561	0.0162	0.1298	0.1366
900,000	0.1634	0.6517	0.1131	0.0487	0.0150	0.1181	0.1248
1,000,000	0.1432	0.6255	0.1002	0.0428	0.0139	0.1083	0.1150
2,000,000	0.0558	0.4389	0.0404	0.0167	0.0080	0.0584	0.0642
3,000,000	0.0313	0.3289	0.0215	0.0089	0.0056	0.0388	0.0439
4,000,000	0.0206	0.2556	0.0132	0.0055	0.0042	0.0282	0.0328
5,000,000	0.0148	0.2032	0.0087	0.0037	0.0034	0.0214	0.0256
6,000,000	0.0112	0.1640	0.0061	0.0026	0.0028	0.0168	0.0205
7,000,000	0.0089	0.1339	0.0045	0.0020	0.0023	0.0135	0.0168
8,000,000	0.0072	0.1103	0.0034	0.0015	0.0020	0.0109	0.0140
9,000,000	0.0060	0.0916	0.0026	0.0012	0.0017	0.0090	0.0118
10,000,000	0.0050	0.0764	0.0021	0.0010	0.0015	0.0075	0.0100

FORMULAS, CALCULATIONS, AND TEST VALUES FOR CUMULATIVE PROBABILITY (LOSS ONLY)

CLAIM GROUP CUMULATIVE DENSITY FUNCTION

$For\ \frac{x}{UP} \leq a$

$F(x) = \sum_{k=1}^{2} w_k\ \Phi\left(\frac{\ln\frac{x}{UP} - \mu_k}{\sigma_k}\right)$

$For\ \frac{x}{UP} > a$

$F(x) = 1 - S\left(\frac{m\left(\frac{x}{UP} - a\right) + b}{b}\right)^{-\frac{m+1}{m}}$

OVERALL PER CLAIM CUMULATIVE DENSITY FUNCTION

$F(x) = \sum_{Claim\ Group=i} CCW_i \cdot F_i(x)$

EXAMPLE CDF at 250,000

From Exhibit IV

State	Claim Group	w_1	w_2	μ_1	μ_2	σ_1	σ_2	m	a	b	S
CW	Fatal	0.657	0.343	-0.171	-2.019	0.855	1.725	0.67	5.85	4.318	0.01256
CW	PT	0.925	0.076	-0.786	1.118	1.010	0.717	0.72	6.47	3.298	0.01516
CW	Likely PP/TT	0.679	0.321	-1.209	-0.360	1.467	1.090	0.59	56.20	29.933	0.00013
CW	Not Likely PP/TT	0.950	0.050	-1.174	0.236	1.517	0.509	0.47	125.00	63.963	0.00004
CW	Med Only	0.978	0.022	-0.828	-0.892	1.217	2.218	0.96	626.00	773.485	0.00001

Hypothetical Values from *Excess Loss Factor Calculations* - Hazard Group X

Claim Group	Total Loss	Claim Count	Average Cost Per Case	Claim Group Loss Weight	Claim Group Claim Count Weight	UP (Loss Only)
Fatal	2,384,961	7.1216	334,890.20	0.01578	0.00081	335,057.28
PT	12,414,792	6.5941	1,882,718.57	0.08216	0.00075	1,892,723.93
Likely PP/TT	51,037,027	383.6200	133,040.58	0.33775	0.04388	133,058.43
Not Likely PP/TT	75,299,859	1,885.6800	39,932.47	0.49831	0.21569	39,933.28
Med Only	9,974,373	6,459.7200	1,544.09	0.06601	0.73887	1,544.35

FORMULAS, CALCULATIONS, AND TEST VALUES FOR CUMULATIVE PROBABILITY (LOSS ONLY)

Because $\frac{250,000}{335,057.28}$ is less than splice point 5.85 use the lognormal formula below for R(x). Otherwise use the Pareto Formula

$$F(250,000) = .657\ \Phi\left(\frac{\ln\frac{250,000}{335,057.28}-(-.171)}{.855}\right) + .343\ \Phi\left(\frac{\ln\frac{250,000}{335,057.28}-(-2.019)}{1.725}\right) = .5799$$

Hypothetical CW CDFs - Hazard Group X

Limit (x)	Fatal	Permanent Total	PP and TT Likely	PP and TT Not Likely	Medical Only	Per Claim
10,000	0.0664	0.0000	0.1244	0.4227	0.9846	0.8242
15,000	0.0909	0.0000	0.1872	0.5241	0.9931	0.8551
20,000	0.1109	0.0001	0.2428	0.5955	0.9961	0.8752
25,000	0.1281	0.0002	0.2921	0.6495	0.9975	0.8900
30,000	0.1434	0.0004	0.3362	0.6926	0.9982	0.9018
35,000	0.1574	0.0007	0.3757	0.7282	0.9987	0.9116
40,000	0.1704	0.0011	0.4114	0.7581	0.9989	0.9198
50,000	0.1949	0.0022	0.4734	0.8054	0.9993	0.9330
75,000	0.2521	0.0072	0.5889	0.8778	0.9996	0.9540
100,000	0.3073	0.0152	0.6686	0.9157	0.9997	0.9658
200,000	0.5028	0.0683	0.8309	0.9683	0.9999	0.9846
250,000	0.5799	0.1018	0.8705	0.9774	0.9999	0.9884
300,000	0.6439	0.1367	0.8977	0.9831	0.9999	0.9909
400,000	0.7405	0.2065	0.9319	0.9896	1.0000	0.9939
500,000	0.8068	0.2725	0.9518	0.9930	1.0000	0.9957
600,000	0.8532	0.3326	0.9643	0.9950	1.0000	0.9967
700,000	0.8863	0.3867	0.9726	0.9963	1.0000	0.9974
800,000	0.9105	0.4351	0.9785	0.9972	1.0000	0.9979
900,000	0.9284	0.4782	0.9827	0.9978	1.0000	0.9983
1,000,000	0.9420	0.5167	0.9859	0.9982	1.0000	0.9986
2,000,000	0.9880	0.7426	0.9967	0.9996	1.0000	0.9996
3,000,000	0.9953	0.8378	0.9987	0.9999	1.0000	0.9998
4,000,000	0.9976	0.8879	0.9993	0.9999	1.0000	0.9999
5,000,000	0.9986	0.9183	0.9996	1.0000	1.0000	0.9999
6,000,000	0.9991	0.9384	0.9998	1.0000	1.0000	0.9999
7,000,000	0.9994	0.9525	0.9998	1.0000	1.0000	1.0000
8,000,000	0.9995	0.9627	0.9999	1.0000	1.0000	1.0000
9,000,000	0.9997	0.9703	0.9999	1.0000	1.0000	1.0000
10,000,000	0.9997	0.9761	0.9999	1.0000	1.0000	1.0000

FORMULAS, CALCULATIONS, AND TEST VALUES FOR STATE CURVE PARAMETERS

Using the Rvalues associated with the claim group the $\mu_i$and σ_i parameters for the state are found using the adjustment formula below
The w, a and m parameters are not adjusted based on the Rvalues

CLAIM GROUP ADJUSTMENTS TO MU AND SIGMA PARAMETERS

$$\sigma_i^{State} = Rvalue \cdot \sigma_i^{CW}$$

$$\mu_i^{State} = Rvalue \cdot \mu_i^{CW} - \ln\left(\sum_{i=1}^{2} w_i \, e^{Rvalue\ \mu_i^{CW} + \frac{(\sigma_i^{State})^2)}{2}}\right)$$

CALCULATE S AND b PARAMETERS

$$S = 1 - w_1 \ \Phi\left(\frac{\ln a - \mu_1}{\sigma_1}\right) - w_2 \ \Phi\left(\frac{\ln a - \mu_2}{\sigma_2}\right)$$

$$b = \frac{\sum_{i=1}^{2}\left[w_i\left[e^{\mu_i + \frac{\sigma_i^2}{2}}\left(1 - \Phi\left(\frac{\ln a - \mu_i}{\sigma_i} - \sigma_i\right)\right) - a\left(1 - \Phi\left(\frac{\ln a - \mu_i}{\sigma_i}\right)\right)\right]\right]}{S}$$

EXAMPLE

From Exhibit IV

State	Claim Group	w_1	w_2	μ_1	μ_2	σ_1	σ_2	m	a	b	S	*Rvalue*
CW	Fatal	0.657	0.343	-0.171	-2.019	0.855	1.725	0.67	5.85	4.318	0.0125575	1.000
State	Fatal	0.657	0.343	-0.208	-2.137	0.893	1.801	0.67	5.85	4.650	0.0140585	1.044

Use Rvalue to calculate Mus and Sigmas for State

w_i, m and a are not adjusted

$$\sigma_1 = 1.044 \cdot .855 = .893$$

$$\sigma_2 = 1.044 \cdot 1.725 = 1.801$$

$$\mu_1 = 1.044 \cdot (-.171) - \ln\left(.657 \cdot e^{1.044\cdot(-.171) + \frac{.893^2}{2}} + .343 \cdot e^{1.044\cdot(-2.019) + \frac{1.081^2}{2}}\right) = -.208$$

$$\mu_2 = 1.044 \cdot (-2.019) - \ln\left(.657 \cdot e^{1.044\cdot(-.171) + \frac{.893^2}{2}} + .343 \cdot e^{1.044\cdot(-2.019) + \frac{1.081^2}{2}}\right) = -2.137$$

FORMULAS, CALCULATIONS, AND TEST VALUES FOR STATE CURVE PARAMETERS

Calculate S and b Parameters

$$S = 1 - .657\,\Phi\left(\frac{\ln 5.85 - (-.208)}{.893}\right) - .343\,\Phi\left(\frac{\ln 5.85 - (-2.137)}{1.801}\right) = .014$$

$$b = \frac{.657\left[e^{-.208+\frac{.893^2}{2}}\left(1-\Phi\left(\frac{\ln 5.85-(-.208)}{.893}-.893\right)\right)-5.85\left(1-\Phi\left(\frac{\ln 5.85-(-.208)}{.893}\right)\right)\right]+.343\left[e^{-2.137+\frac{1.801^2}{2}}\left(1-\Phi\left(\frac{\ln 5.85-(-2.137)}{1.801}-1.801\right)\right)-5.85\left(1-\Phi\left(\frac{\ln 5.85-(-2.137)}{1.801}\right)\right)\right]}{.014} = 4.650$$

ADJUSTING COUNTRYWIDE CURVES TO STATE CURVES

Notation:

Standard deviation of logged losses for claim group in state	σ_{Log}^{State}
Standard deviation of logged losses for claim group countrywide	σ_{Log}^{CW}
State Credibility	z
State Relativity of Variation	$Rvalue$

Calculations:

The state credibility $z = \frac{n}{n+k}$, where n is the number of claims in the claim group in state, and k varies by claim group is as follows:

Claim Group	k
Fatal	60
Permanent Total	33
PP and TT, Likely	73
PP and TT, Not Likely	129
Medical Only	373

The State Relativity of Variation , $Rvalue = z\frac{\sigma_{Log}^{State}}{\sigma_{Log}^{CW}} + (1 - z)$, is the credibility-weighted ratio of the standard deviation of state logged losses to the standard deviation of countrywide logged losses.

ADJUSTING COUNTRYWIDE CURVES TO STATE CURVES

Given countrywide excess ratio curve parameters for a given claim group, the state curve parameters are found such that the:

- w, a and m parameters are the same as countrywide
- μ and σ parameters are adjusted
- b and S parameters are recalculated

The μ and σ parameter adjustments

- $\sigma_i^{State} = Rvalue \cdot \sigma_i^{CW}$
- $\mu_i^{State} = Rvalue\ \mu_i^{CW} - \ln\left(w_1 e^{Rvalue\ \mu_1^{CW} + \frac{\left(\sigma_1^{State}\right)^2}{2}} + w_2 e^{Rvalue\ \mu_2^{CW} + \frac{\left(\sigma_2^{State}\right)^2}{2}}\right)$

Calculating S and b Parameters

- $S = 1 - w_1 \Phi\left(\frac{\ln a - \mu_1}{\sigma_1}\right) - w_2 \Phi\left(\frac{\ln a - \mu_2}{\sigma_2}\right)$
- $b = \frac{\sum_{k=1}^{2}\left[w_k\left(e^{\mu_k + \frac{\sigma_k^2}{2}}\left(1 - \Phi\left(\frac{\ln a - \mu_k}{\sigma_k} - \sigma_k\right)\right) - a\left(1 - \Phi\left(\frac{\ln a - \mu_k}{\sigma_k}\right)\right)\right)\right]}{S}$

Note:

- $w_2 = 1 - w_1$

FORM OF LOSS DISTRIBUTIONS USED

The common parameterization of the lognormal distribution is used, where the PDF is

$$f_X(\mu, \sigma; x) = \frac{1}{x\sigma\sqrt{2\pi}} e^{-\frac{(\ln x - \mu)^2}{2\sigma^2}}, \qquad for\ x > 0.$$

The CDF is

$$F_X(\mu, \sigma; x) = \Phi\left(\frac{\ln x - \mu}{\sigma}\right).$$

One of the common parameterizations of the Generalized Pareto distribution is specified by three parameters: location μ, scale σ, and shape ξ, where the CDF is

$$F_G(\xi, \mu, \sigma; x) = \begin{cases} 1 - \left(1 + \frac{\xi(x-\mu)}{\sigma}\right)^{-\frac{1}{\xi}} & for\ \xi \neq 0 \\ 1 - e^{\left(-\frac{x-\mu}{\sigma}\right)} & for\ \xi = 0 \end{cases}$$

for $x \geq \mu$.

However, an alternate parameterization for the Generalized Pareto distribution is used to take advantage of its mean excess loss function having a linear form. The alternate parameterization used makes the following substitutions:

- $\xi = \frac{m}{m+1}$
- $\sigma = \frac{b}{m+1}$
- $\mu = a.$

The CDF resulting from this parameterization is then:

$$F_Y(m, a, b; x) = 1 - \left(\frac{m(x-a) + b}{b}\right)^{-\frac{m+1}{m}} \quad for\ m \neq 0$$

FORM OF LOSS DISTRIBUTIONS USED

This alternate parameterization is used because the parameters a and m are selected using plots of mean excess loss from Extreme Value Theory, especially the Hill Plot. The selection of the splice point a, in conjunction with the parameters of the lognormal mixture distribution, determine the parameter b as well, using the last two equations of Appendix I.

The mean excess loss function for values $x \geq a$ above the splice point is

$$\gamma(x) = m(x - a) + b$$

Note that $\gamma(x)$ is linear and increasing, since for each claim group, the value selected for m is positive. In particular, the mean excess loss at the splice point $x = a$ is the parameter

$$b = \gamma(a).$$

Because $m > 0$, the Generalized Pareto conforms to a traditional Pareto distribution, whose CDF is often parameterized as:

$$F_P(\alpha, \theta; x) = 1 - \left(\frac{\theta}{x + \theta}\right)^{\alpha} \quad for\ x \geq 0$$

For $x \geq a$:

$$F_Y(m, a, b; x) = F_P\left(\frac{m + 1}{m}, \frac{b}{m}; x - a\right).$$

Excess Loss Factor Calculations

Excess Loss Factor Calculations

Table of Contents

Title / Description **Page**

Exhibits 1-10 are no longer contained within the PDF. Please see ‘Exhibits in Excel’.

Excess Loss Factor Calculations — Introduction

Excess Loss Factor Calculations contains the data, assumptions, and methodology used in NCCI filings to derive Excess Loss Factors (ELFs) by state. In retrospective rating, ELFs are used when an insured elects to limit the amount of incurred losses to be included in the retrospective rating premium. The charge for this loss limitation is called Excess Loss Premium. ELFs vary by state, hazard group, and loss limit.

ELFs are also used in pricing other types of coverage arrangements, such as excess reinsurance, deductibles, and direct excess policies.

They are applicable for the effective period underlying the state's associated rate or loss cost filing (the filing effective date applicable to the approved ELFs is shown on each exhibit of this product).

Types of ELFs

An ELF, as a generic term, is defined as the ratio of the expected portion of losses greater than a loss limit per-occurrence to some measure of premium. For example, given a loss limit of $200,000 and an associated ELF of 10%, the expected losses over the deductible or retention of $200,000 per-occurrence is equal to 10% of the appropriate type of premium.

- **Excess Loss Factors (ELFs)** represent the expected amount of losses above a given limit relative to full standard premium (including expenses). ELFs do not take into account the inclusion of allocated loss adjustment expense (ALAE) as part of incurred losses.

  ELFs are only provided for states where NCCI files and publishes full rates.

- **Excess Loss and Allocated Loss Adjustment Expense Factors (ELAEFs)** represent the expected amount of losses and ALAE above a given limit relative to full standard premium (including expenses). ELAEFs apply when the definition of loss includes allocated loss adjustment expense (ALAE).

  These optional values are provided for some of the states where NCCI files and publishes full rates.

- **Excess Loss Pure Premium Factors (ELPPFs)** represent the expected amount of losses above a given limit relative to NCCI pure premium. ELPPFs do not take into account the inclusion of ALAE as part of incurred losses.

ELPPFs are provided for states where NCCI publishes loss costs. Carriers that want to issue retrospective rating policies with a loss limitation will need to convert ELPPFs to ELFs. Refer to the ***Retrospective Rating Plan Manual*** for additional information, including the formula used to convert ELPPFs to ELFs.

- **Excess Loss and Allocated Loss Adjustment Expense Pure Premium Factors (ELAEPPFs)** represent the expected amount of losses and ALAE above a given limit relative to NCCI pure premium. ELAEPPFs apply when the definition of loss includes ALAE.

  These optional values are provided for some loss cost states, but not for all.

Note: If the loss costs include loss-based expenses (loss adjustment expenses and/or loss-based assessments), the pure premium includes these provisions, as well. In states where NCCI files loss costs including loss-based expenses, ELPPFs and ELAEPPFs, if applicable, are both applied to the same NCCI pure premium base. Accordingly, for a given limit, the ELPPF is less than the corresponding ELAEPPF because the latter produces expected excess losses and allocated loss adjustment expenses, while the former produces expected excess losses only. ELAEPPFs are not published in states where NCCI files loss costs excluding loss adjustment expenses (LAE).

ELFs and Hazard Groups

The hazard group system is comprised of seven hazard groups (A–G). Classes are placed into hazard groups based on their excess ratios (which are indicative of their potential for having losses in excess of a given threshold) at different loss limits. Classes in Hazard Group A have the lowest potential for large claims, while those in Hazard Group G have the highest. NCCI's ***Basic Manual*** contains a complete list of hazard groups associated with each class.

ELFs—Overview

The key data elements used in NCCI's computation of ELFs by state are payroll, incurred losses, average costs, claim frequencies, loss weights, and excess ratios. While the average costs per case (ACCs) represent the average severity of non-catastrophic claims by claim group and hazard group, loss weights show for each hazard group the percentage of losses from each claim group.

The payroll, incurred losses, claim counts, and average costs are based on statewide data and are determined at the claim group and hazard group level using five policy periods of Unit Statistical Plan data. Each state's data is input into two Bayesian statistical models: one calculates values used to calculate fitted state ACCs, and the other model computes values used to calculate fitted state claim counts. The two models are described in detail in other sections of this document.

Excess ratios, defined as the ratio of expected losses greater than a particular limit to total expected losses, are determined by NCCI as follows:

- Countrywide claim severity distributions (curves) are fit for each claim group using a mixture of two lognormal distributions spliced with a Generalized Pareto distribution where the data becomes sparse.
- State curves are shaped directly from the countrywide curves for each claim group using the standard deviation of logged claim amounts for each state relative to countrywide. These credibility-weighted relativities (or R-values) vary by claim group and are applied to the parameters of the countrywide curves.
- Per-claim excess ratios are calculated by claim group using the loss distributions and are then weighted together to arrive at an overall per-claim excess ratio by hazard group.
- The change from a per-claim to a per-occurrence excess ratio is done through the application of the results of a model using countrywide data which captures the number and amounts of individual claims per-occurrence, as well as the correlation between claim amounts for claims within an occurrence.

For further details on the curves, refer to NCCI's 2019 update to the ***Excess Loss Factor Parameters and Tables*** product.

Calculating ELFs—Average Costs per Case or Severity

The losses that enter the calculation of average costs are developed, onleveled, and trended to the midpoint of the filing effective period (Exhibits 1 and 2). For each state, these adjustments are applied by claim group and hazard group, separately for indemnity and medical. The latest five available policy periods for each state are used. Claim counts are also developed to ultimate and are inputs to the multilevel model along with the adjusted losses. The ACCs based on the empirical data are shown at a claim group and hazard group level for each of the five policy periods in Exhibits 1 and 2.

Calculating ELFs—Model Output: Fitted State Average Costs per Case

The relativities in Exhibit 3 (as well as the "base" ACCs) are produced via a Bayesian multilevel model. NCCI uses the output from the multilevel model to smooth the volatility in the data, pulling as much information out of the observed data, while discarding the random noise. The model strives to find the optimal balance between responsiveness and stability by considering both observed claim counts and intrastate variation relative to the interstate variation. All parameters are estimated simultaneously and only reflect the included claim groups.

The relativities are multiplied together, by matching the state, hazard group, and claim group fields, with the base ACC to produce the fitted state ACCs. This approach is used for the following claim groups:

- Fatal
- Likely-to-develop permanent partial and temporary total (PP/TT)
- Not-likely-to-develop PP/TT

Due to the large number of observed claims and their minor impact on the magnitude of excess ratios, the empirical medical-only ACC is used, and thus, these claims are not modeled. The permanent total claim group is treated differently and described later in the "Calculating ELFs—Treatment of Permanent Total (PT) Claim Group" section of this Introduction.

The following briefly describes each element or parameter of the model output for determining fitted state ACCs:

Fitted Base Average Cost per Case represents the fitted severity for each claim group in the "typical" state at a Hazard Group A level. The value of this parameter is constant across states, analogous to a base rate conceptually.

State Relativity is the ratio of the severity for the state to the severity for the typical state. State Relativities reflect all state differences in a state's ACC and is normalized to a geometric mean of 1.0 across all states.

Claim Group-Hazard Group Relativity is the ratio of the ACC for a given hazard group (within a claim group) to the ACC for all hazard groups (within a claim group). Claim Group-Hazard Group Relativities reflect how severity varies across hazard groups within each claim group. The value of these parameters is constant across states.

State-Claim Group Relativity is the ratio of the ACC for a given claim group to the ACC over all claim groups. State-Claim Group Relativities reflect relative claim group severity and are normalized to a geometric mean of 1.0 by state and claim group. The value of these parameters varies across states.

Fitted State Average Cost per Case represents the fitted severity and is the product of the four parameters above. The relativities are multiplied together by matching state, hazard group, and claim group fields.

Calculating ELFs—Model Output: Fitted State Claim Counts

Exhibit 4 illustrates both observed data (five years of payroll) for the state and several parameters estimated from a Bayesian multilevel model for frequency (claims per million dollars of payroll). The model strives to find the optimal balance between responsiveness and stability by considering both volume and intrastate variation relative to the interstate variation. All parameters are estimated simultaneously and are based only on the included claim groups (i.e., Fatal, Likely PP/TT, and Not Likely PP/TT).

The following briefly describes each element or parameter of the model output for determining fitted claim counts:

Observed Payroll ($ millions) is shown by state, policy period, and hazard group. This is a model input, not an output. It serves as a measure for the exposure base.

Policy Period Relativity is the ratio of claim count per payroll for a given policy period to the ratio of claim count per payroll of the latest policy period. Policy period relativities reflect any temporal differences in the relationship between payroll and claim counts. Possible reasons for shifts over time include, but are not limited to, wage-level changes. These parameters, and the patterns they reflect, are constant across all states, hazard groups, and claim groups. The latest policy period is base level 1.000.

Adjusted Payroll is the sum product of Policy Period Relativities and Observed Payroll for the state. It represents total payroll adjusted to a common “policy period” level.

State Relativity, in this model, is the ratio of claim count per payroll for the state to claim count per payroll for a typical state. The State Relativity reflects all absolute state differences in claim frequency and is normalized to a geometric mean of 1.0 across all states.

State-Hazard Group Relativity is the ratio of claim count per payroll for a given hazard group to claim count per payroll over all hazard groups. State-Hazard Group Relativities reflect state variation in hazard group frequency without capturing any absolute state or hazard group differences and are normalized to a geometric mean of 1.0 by state and hazard group. The value of these parameters differs by state.

Claim Group Frequency represents the fitted frequency for the "typical" state at a Hazard Group A level for a policy period. The value of these parameters is constant across states.

Claim Group-Hazard Group Relativity, in this model, is the ratio of the claim count per payroll for a given hazard group (within a claim group) to the claim count per payroll over all hazard groups (within a claim group). Claim Group-Hazard Group Relativities reflect how frequency varies across hazard groups within each claim group, relative to the frequency of Hazard Group A. The value of these parameters is constant across states.

State-Claim Group Relativity, in this model, is the ratio of the claim count per payroll for a given claim group to the claim count per payroll over all claim groups. State-Claim Group Relativities reflect relative claim group frequency and are normalized to a geometric mean of 1.0 by state and claim group. The value of these parameters varies across states.

Fitted State Claim Counts represent the fitted total claims over the five policy periods. The five-year total is directly computed by first calculating Adjusted Payroll. The fitted state claim counts are the product of the following parameters, and presented as non-integers for the fatal and PT claim groups:

- Adjusted Payroll
- State Relativity
- State-Hazard Group Relativities
- Claim Group Frequency
- Claim Group-Hazard Group Relativities
- State-Claim Group Relativities

Alternatively, one can produce Fitted State Claim Counts by policy period and then sum across the reports.

Due to the large number of observed claims, and the relatively minimal impact that the medical-only claim group has on the magnitude of excess ratios, the empirical medical-only values are used, and thus, these claims are not modeled. The permanent total claim group is treated differently and described later in the "Calculating ELFs—Treatment of Permanent Total (PT) Claim Group" section of this Introduction.

Calculating ELFs—Determining Fitted Loss Weights

The per-claim excess ratios for each claim group are weighted together using fitted loss weights to produce an overall per-claim excess ratio per loss limit for a given hazard group. First, the fitted state ACCs are multiplied by the fitted state claim counts to determine "state total losses" by hazard group and claim group. Then, the fitted loss weight percentages are calculated from the state total losses and shown in Exhibit 5.

Calculating ELFs—Determining Unlimited Parameters

The Unlimited Parameter (UP) varies by state, hazard group, and claim group and is derived such that the average severity limited to $50M is equal to the fitted ACC. This is done to ensure that the per-claim excess ratios at a loss limit of $50M are zero (non-catastrophe).

Calculating ELFs—Determining Loss and ALAE Excess Loss Factors

Column (3) of the following table illustrates the countrywide ALAE Adjustment Factors by claim group, which represent the claim group relativities that NCCI is applying to all states. These ratios are based on historical countrywide estimates of ALAE to pure loss by claim group, but scaled to balance to what is implied by the statewide estimated ratio of loss including ALAE to pure loss (in this case, 1.132):

Claim Group	(1) Statewide ALAE Factor	(2) Pure Loss Severity	(3) CW ALAE Adjustment	(4) Off-Balance Factor = [(1) – 1] /Total (3)	(5) ALAE Adjustment Factor = (3) x (4)	(6) Loss & ALAE Severity = (2) x [1+ (5)]
Fatal	1.132	339,653	0.0590	1.237	0.0730	364,448
PT	1.132	1,720,992	0.0782	1.237	0.0967	1,887,412
Likely PP/TT	1.132	107,754	0.1188	1.237	0.1470	123,594
Not-Likely PP/TT	1.132	29,542	0.1132	1.237	0.1400	33,678
Medical-Only	1.132	2,052	0.1320	1.237	0.1633	2,387
Overall	1.132	-	0.1067	1.237	0.1320	-

The fitted state ACC by hazard group from Exhibit 3 is multiplied by the scaled state ALAE factor [1 + (5)] to get the resulting Loss + ALAE ACC. The total losses and ALAE values, used for determining the loss and ALAE weights, are similarly computed from the state total losses shown in Exhibit 4.

Calculating ELFs—Treatment of Permanent Total (PT) Claim Group

Because of the low PT claim volume and high variation in individual PT claim amounts, average reported PT severity in all but the largest states can be quite volatile from year to year, and resulting ELF values could fluctuate considerably as a result.

To reduce fluctuations in ELFs from year to year, two fundamental amounts are determined and held constant for every five years by NCCI. They are:

1. An initial PT severity by state and hazard group
2. The PT share of lost-time claims by state and hazard group

This treatment stabilizes ELFs by reducing volatility due to reported data while allowing responsiveness to changes in state average claim cost trends.

Calculating ELFs—Indicated PT Claim Counts

PT loss weights are derived using an assumption of a constant ratio of the number of PT claims to total indemnity claims at the state and hazard group level.

Exhibit 7A displays the state-expected claim counts determined by the same multilevel model used for determining the fitted state claim counts in Exhibit 4. However, the inputs include PT claim counts by state and hazard group along with data for the other claim groups, developed to ultimate value. In addition, the initial PT model output is based upon the data underlying the base time periods used for determining the excess ratio curves.

Exhibit 7B computes the proportion of total lost-time claim counts represented by the PT claim group. This value is held constant over time and applied to the total of the fitted state claim counts from Exhibit 5B for the purpose of stabilizing loss weights over time. The indicated PT claim count in Exhibit 7D is the product of the constant initial PT proportion to the sum of the lost-time claim counts for the other claim groups, which are updated every year.

Calculating ELFs—Indicated PT Average Cost per Case

Exhibit 8A displays the state ACC as determined by the same multilevel model used for determining the state fitted ACC. However, the inputs include PT loss amounts by state and hazard group along with data for the other claim groups developed to an ultimate value. In addition, the initial PT model output is based upon the data underlying the base time periods used for determining the excess ratio curves.

Exhibit 8B illustrates that the PT severity is trended in two stages:

1. From the midpoint of the time period used to calculate the initial ACC to the midpoint of the experience period for the annual ELF update
2. From the midpoint of the experience period for the annual ELF update to the midpoint of the period that the updated ELFs are expected to be effective

The first stage trend uses countrywide lost-time severity trend factors of 2% per year for indemnity and 3% per year for medical.

The second stage trend uses state-specific lost-time severity trend factors for indemnity and medical from the most recently approved state loss cost or rate filing. The resulting trends from each stage are multiplied to determine a combined trend amount in Exhibit 8C.

The other PT adjustment factors account for state specific benefit onlevels and an indemnity and medical loss split, and are applied to determine the indicated PT ACC found in Exhibit 8E. The PT indemnity and medical loss split is calculated based on the PT losses used in the multilevel model that determines the PT state ACC.

More information on NCCI's procedures for calculating ELFs can be found in the following articles:

1. Robertson, J. P., "NCCI's 2007 Hazard Group Mapping," *Variance 3*, 2009, pp. 194–213
2. Corro and Tseng, "NCCI's 2014 Excess Loss Factors," *Variance Journal*

(1) Excess Ratio, Loss Only

$$E(x) = 1 - \frac{Average\ Severity\ Limited\ to\ x^{1}}{Fitted\ Average\ Cost\ per\ Case}$$

(2) Excess Loss Factor

$$ELF = \frac{Expected\ Excess\ Loss}{NCCI\ Standard\ Premium}$$

(3) Excess Loss and Allocated Loss Adjustment Expense Factor

$$ELAEF = \frac{Expected\ Excess\ Loss\ and\ Allocated\ Loss\ Adjustment\ Expense}{NCCI\ Standard\ Premium}$$

(4) Excess Loss Pure Premium Factor

$$ELPPF = \frac{Expected\ Excess\ Loss}{NCCI\ Standard\ Pure\ Premium}$$

(5) Excess Loss and Allocated Loss Adjustment Expense Pure Premium Factor

$$ELAEPPF = \frac{Expected\ Excess\ Loss\ and\ Allocated\ Loss\ Adjustment\ Expense}{NCCI\ Standard\ Pure\ Premium}$$

Note: If the loss costs include loss-based expenses (loss adjustment expenses and/or loss-based assessments), the pure premium includes these provisions, as well. In states where NCCI files loss costs including loss-based expenses, both ELPPFs and ELAEPPFs are applied to the same NCCI pure premium base. Accordingly, for a given limit, the ELPPF is less than the corresponding ELAEPPF because the latter produces expected excess losses and allocated loss adjustment expenses, while the former produces expected excess losses only. ELAEPPFs are not published in states where NCCI files loss costs excluding loss adjustment expenses (LAE).

[1] Loss distribution formulated in NCCI's 2019 update to the ***Excess Loss Factor Parameters and Tables*** product.

NATIONAL COUNCIL ON COMPENSATION INSURANCE, INC.

MISSOURI ADVISORY LOSS COSTS AND RATING VALUES FILING—JANUARY 1, 2022

RESPONSES TO THE DEPARTMENT OF COMMERCE AND INSURANCE'S REQUESTS DATED SEPTEMBER 24, 2021

1. **Regarding the response to objection 5 of the questions dated September 1, 2021, please explain the process where the mix impact was estimated by comparing a hypothetical AWW using CY 2019 AWW by sector with the 2020 employment mix by sector to the actual CY 2019 AWW. How was the hypothetical AWW chosen and were other hypothetical AWWs tested? Please provide a numeric example of this process.**

   The hypothetical 2020 AWW is derived by combining the 2020 employment by sector with the 2019 AWW by sector. The resulting 2020 AWW is what would have resulted had average weekly wages by sector remained unchanged; any change in this hypothetical 2020 AWW is driven solely by a shift in employment by sector. Because this hypothetical 2020 AWW grew by +1.3% (and +1.6% countrywide), 1.3% of the actual growth of +6.3% is due the shift in sector mix. Accordingly, this growth of 1.3% was removed from the restated 2020 AWW.

   Please see Exhibit 1 for a numeric example.

2. **Regarding the responses to objection 10 of the questions dated September 1, 2021:**
   a. **Has this process changed from last year's filing?**
   b. **Please provide the underlying data and calculations for the following columns in Exhibit 10a:**
      i. **Adjustment to Reverse AOE Credits**
      ii. **Adjustment for Losses Associated with TPA Agreements**
      iii. **Adjustment to Convert Losses from Net to Gross of Deductible**
      iv. **Pct. Of Reported COVID-19-Related Losses to Total Losses**
   c. **Were the same factors mentioned in 2b used in last year's analysis?**

   a) The methodology is largely the same as last year. This year, in consideration of the COVID-19 pandemic, NCCI implemented an additional adjustment which removed the direct effects of reported COVID-19-related losses as a percent of total losses.
   b) Please see Exhibit 2 for this information.
   c) The Adjustment to Reverse AOE Credits and the Adjustment for Losses Associated with TPA Agreements are derived using the same methodology as last year's analysis, but with updated carrier data reported as of 12/31/2020. The Adjustment to Convert Losses from Net to Gross of Deductible was re-evaluated with updated data, and ultimately this year's adjustment value was equivalent to the adjustment value used in last year's analysis. An adjustment to remove the direct effect of COVID-19-related losses was incorporated in this analysis as such information did not exist in the previous year's analysis.

3. Regarding Exhibit 22 that was submitted in response to objection 22 of the questions dated September 1, 2021, please provide the underlying data and calculations for the excess ratios derived in this exhibit.

The countrywide data provided in response to objection 22 of the questions dated September 1, 2021 is derived from each individual state's fitted average costs per case, fitted claim counts and total losses. Missouri's values contributing to the countrywide data can be seen on Exhibits 5A-5C of 'MO ELF 2022-1-1' attached. For more information on these values please see the attached file 'Excess Loss Factor Calculations.'

The countrywide data is then used to calculate each claim groups' excess ratio. An example of this calculation can be seen in Exhibit VI of 'CW20191001' attached. Finally, the claim group excess ratios are weighted together for each hazard group to calculate the weighted average excess ratio.

Missouri

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Wages (Millions)		Employment (000s)		Actual AWW		Hypoth. AWW
BLS Sector	**2019**	**2020**	**2019**	**2020**	**2019**	**2020**	**2020**
Mining; quarrying; and oil and gas extraction	$304	$310	4	4	$1,393	$1,443	
Utilities	$1,227	$1,249	12	12	$2,006	$2,054	
Construction	$8,131	$8,508	127	125	$1,234	$1,304	
Manufacturing	$17,176	$16,921	277	266	$1,192	$1,223	
Wholesale trade	$9,055	$9,240	123	120	$1,414	$1,484	
Retail trade	$9,390	$9,693	304	292	$593	$639	
Transportation and warehousing	$5,472	$5,551	105	105	$1,006	$1,021	
Information	$4,133	$3,879	48	45	$1,649	$1,663	
Finance and insurance	$11,839	$12,533	136	137	$1,674	$1,757	
Real estate and rental and leasing	$1,937	$1,982	39	37	$945	$1,025	
Professional; scientific; and technical services	$13,546	$13,861	163	161	$1,602	$1,661	
Management of companies and enterprises	$7,318	$6,955	65	62	$2,169	$2,153	
Admin. and support and waste mgmt. and remediation svcs.	$6,302	$6,379	155	143	$781	$861	
Educational services	$2,668	$2,658	63	61	$819	$841	
Health care and social assistance	$20,751	$21,297	431	419	$927	$978	
Arts; entertainment; and recreation	$1,805	$1,619	43	31	$811	$1,001	
Accommodation and food services	$5,930	$5,345	266	222	$429	$464	
Other Services	$5,027	$5,095	120	113	$807	$870	
Farms	$305	$323	96	90	$61	$69	
Fishing; hunting; etc.	$207	$233	3	3	$1,268	$1,496	
Total Private	$132,523	$133,632	2,579	2,446	$988	$1,051	$1,001

(5) = [(1) × 1,000,000] / [(3) × 1,000] / 52

(6) = [(2) × 1,000,000] / [(4) × 1,000] / 52

(7 Total) = [∑ (4) × (5)] / (4 Total)

Actual AWW growth = $1,051 / $988 − 1 — 6.3%

AWW growth due to change in sector mix = $1,001 / $988 − 1 — 1.3%